COMPACT DISC PLAYER

CD-2000/CD-2000M

SERVICE MANUAL

IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherant to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

CD-2000/M

■ CONTENTS

100006

SINCE 1887 YAMAHA

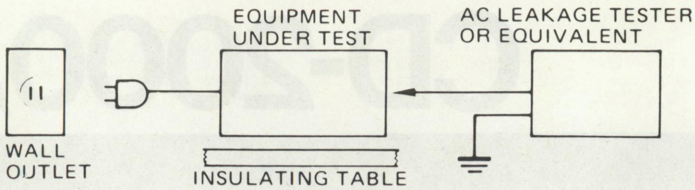
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

2.85K-365 Printed in Japan '86.2

TO SERVICE PERSONNEL

1. Critical Components Information.
   Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

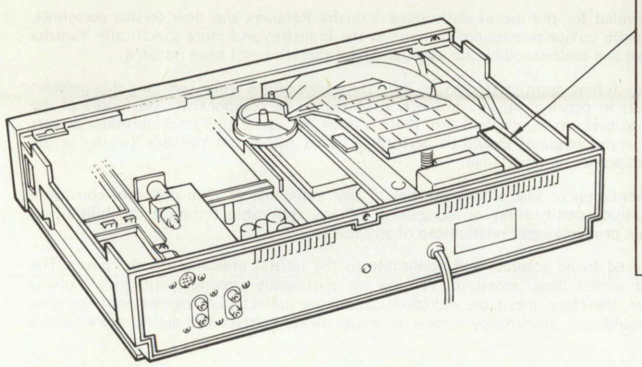
2. Leakage Current Measurement (For 120V Model Only).
   When service has been completed, it is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.



- Meter impedance should be equivalent to 1500 ohm shunted by 0.15μF
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.

CAUTION – USE OF CONTROLS, ADJUSTMENTS, OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN, MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

THE COMPACT DISC PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.



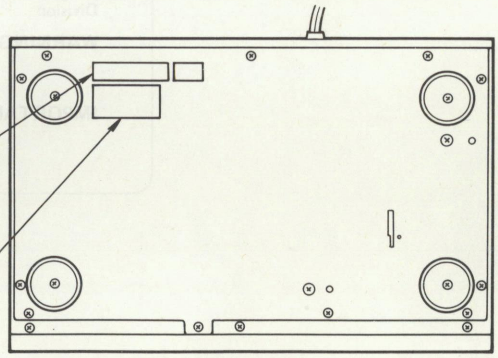
U.S.A. model

DANGER–Invisible laser radiation when open and interlock failed or defeated.
AVOID DIRECT EXPOSURE TO BEAM. (CA07626 1)

Canadian model

CAUTION – HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED
ATTENTION – RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L' ENCLENCHEMENT DE SECURITE ANNULE (CB62428)

BOTTOM SIDE



Front side

U.S.A. model

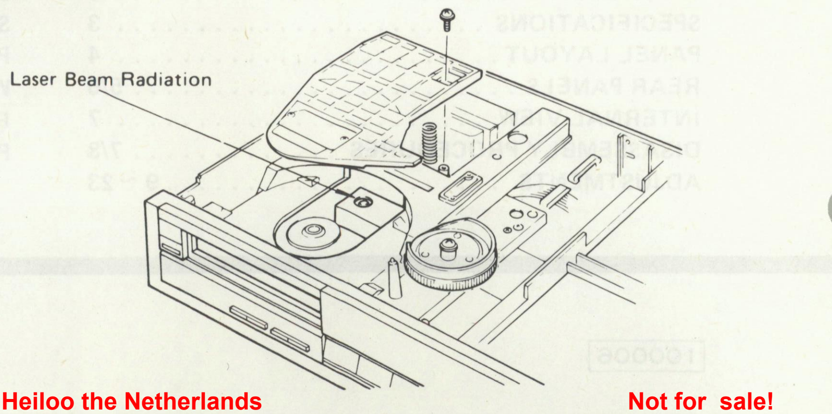
THIS PRODUCT COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE (CB62401 0)

MANUFACTURED BY
NIPPON GAKKI CO LTD
10-1 NAKAZAWA-CHO, HAMAMATSU-SHI
SHIZUOKA-KEN, JAPAN
MANUFACTURED
date code
(CB62400 1)

LASER BEAM RADIATION SPOT

MLP-3

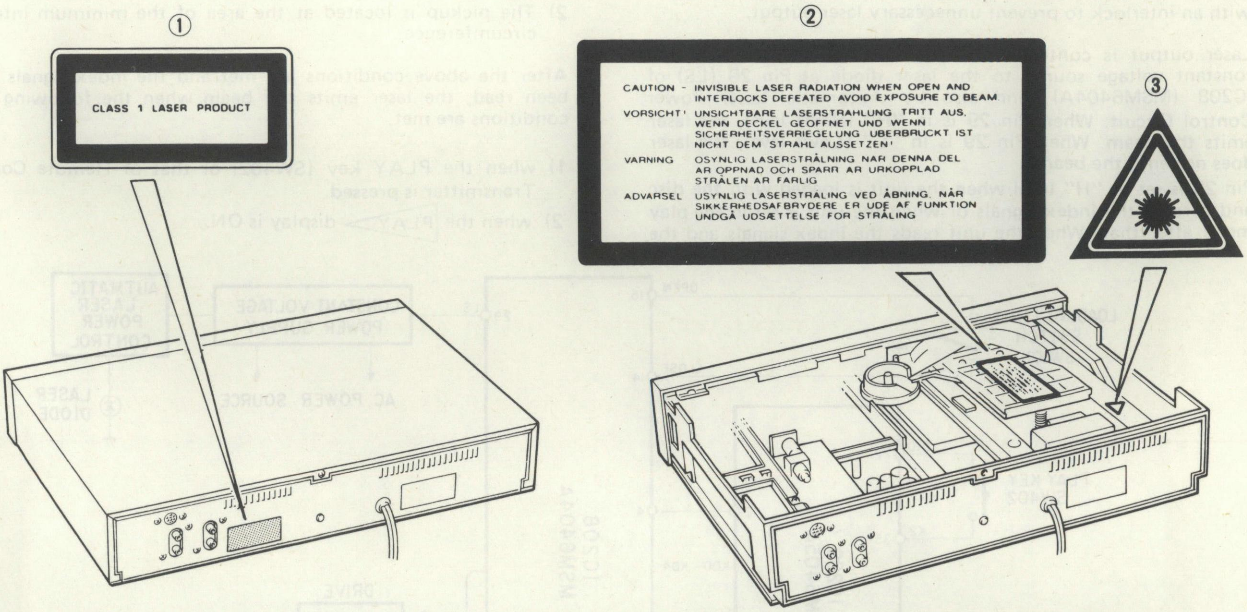
Laser Diode Properties
Material: Ga-Al-As
Wavelength: 755 – 805 nm (25°C)
Laser Output: Continuous Wave max. 5 mW



DG-1

Laser Diode Properties
Material: Ga-Al-As
Wavelength: 780 – 820 nm (25°C)
Laser Output: Continuous Wave max. 5 mW

European model



English

① THIS LABEL IS ATTACHED AT THE PLACE ILLUSTRATED TO INFORM THAT THE APPARATUS CONTAINS A LASER COMPONENT.

② THIS LABEL IS ATTACHED IN THE POSITION SHOWN IN THE ILLUSTRATION TO WARN THAT ANY FURTHER PROCEDURE WILL BRING THE USER INTO EXPOSURE WITH THE LASER BEAM.

③ THE WARNING LABEL INFORMING OF RADIATION IS PLACED INSIDE THE UNIT AS SHOWN IN THE ILLUSTRATION, TO WARN AGAINST FURTHER MEASURES ON THE UNIT. THE EQUIPMENT CONTAINS A LASER COMPONENT RADIATING LASER RAYS EXCEEDING THE LIMIT OF LASER PRODUCTS OF CLASS 1.

CAUTION–USE OF CONTROLS, ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN, MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Swedish

① PÅSKRIFTEN SITTER PÅ APPARATEM SOM VISAS SOM EN UPPMANING OM ATT APPARATEN OMFATTAR EN INBYGGD LASERKOMPONENT.

② TEXTSKYLTEN FÖR LASERN ÄR PLACERAD PÅ APPARATEN SOM EN UPPMANING OM ATT APPARATEN INNEHÅLLER EN LASERKOMPONENT.

③ VARNINGSSKYLTEN FÖR STRÅLNING HAR PLACERATS I APPARATEN, SOM BILDEN VISAR, SOM EN VARNING OM YTTERLIGARE INGREPP I APPARATEN. MATERIELEN INNEHÅLLER EN LASERKOMPONENT SOM AVGER LASERSTRÅLNING ÖVERSTIGANDE GRÄNSEN FÖR LASERKLASS 1.

VARNING–INGREPP I APPARATEN BÖR ENDAST FÖRETAS AV FACKMAN MED KUNSKAP OM ATT RISK FÖRELIGGER FÖR RADIOAKTIV ATRÅLNING.

Danish

① DETTE MÆRKAT ER ANBRAGT SOM VIST I ILLUSTRATIONEN FOR AT ADVARE BRUGEREN OM AT APPARATET INDEHOLDER EN LASERKOMPONENT.

② DETTE MÆRKAT OM LASEREN ER ANBRAGT PÅ APPARATET SOM EN OPLYSNING OM AT APPARATET INDEHOLDER ET LASERKOMPONENT.

③ ADVARSELSKILTET OM STRÅLING ER PLACERET INDENI APPARATET, SOM VIST I ILLUSTRATIONEN, SOM EN ADVARSEL OM YDERLIGERE INDGREB I APPARATET. APPARATET INDEHOLDER ET LASERKOMPONENT SOM AVGIVER LASESTRÅLING DER OVERSTIGER GÆNSEVERDIEN FOR LASERKLASSE 1.

ADVARSEL! INDGREB BØR KUN FORETAGES AF EN FAGMAND DA DER ER RISIKO FOR RADIOAKTIV STRÅLING.

Finnish

③ "VAROITUS! LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ (NÄKYMÄTÖNTÄ) SILMILLE VAARALLISTA LASERSÄTEILYÄ:"

INTERLOCK OPERATION

The Digital Compact Disc Player reads the disc signals by laser beam detection. It must be avoided for the human body to be directly exposed to the laser beam. Human eyes are especially badly affected by the laser beam. This unit is therefore equipped with an interlock to prevent unnecessary laser output.

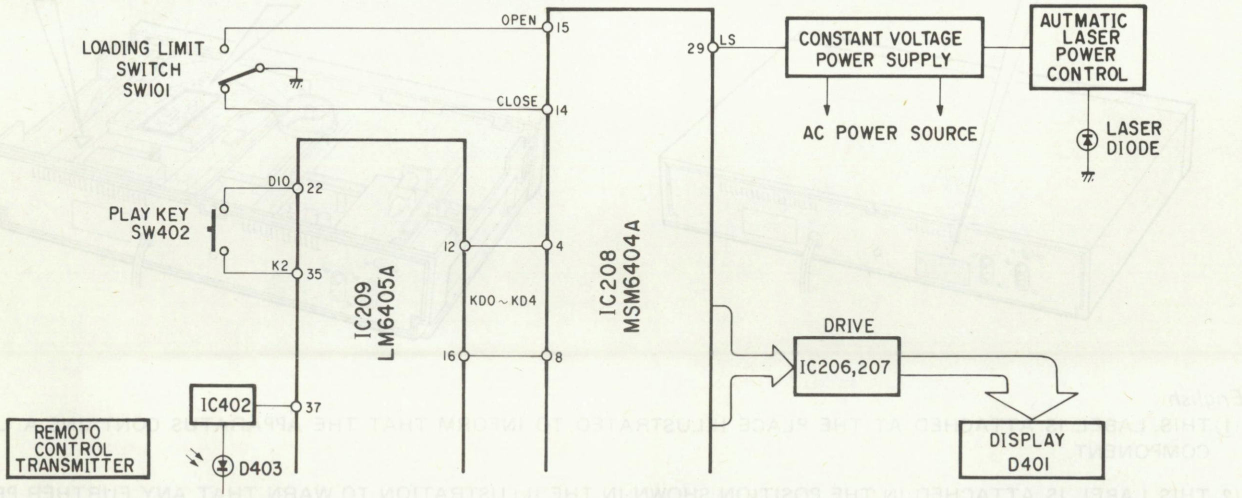
Laser output is controlled by the injection or cutoff of the constant voltage source to the laser diode at Pin 29 (LS) of IC208 (MSM6404A), and also by Automatic Laser Power Control Circuit. When Pin 29 is in "H" (High) level, the laser emits the beam. When Pin 29 is in "L" (Low) level, the laser does not emit the beam.

Pin 29 is set in "H" level when the unit is loaded with the disc and it reads the index signals or when the unit is set in the play mode after that. When the unit reads the index signals and the following two conditions are met, the laser emits the beam.

1) When the Loading Limit Switch (SW101) is set in "CL" side. (The disc tray is closed.)
2) The pickup is located at the area of the minimum internal circumference.

After the above conditions are met and the index signals have been read, the laser emits the beam when the following two conditions are met.

1) when the PLAY key (SW402) or that of Remote Control Transmitter is pressed.
2) when the PLAY display is ON.



SPECIFICATIONS

CD-2000

Format	Compact disc digital audio system
▪ AUDIO SECTION	
Frequency response	2Hz – 20kHz +0.3/–0.3dB
Harmonic distortion	Less than 0.0015% (1kHz) (IEC-A-Network)
Harmonic distortion + noise	Less than 0.0025% (1kHz) (IEC-A-network)
S/N ratio	
IEC FLAT	96dB
IEC A	102dB
Dynamic range	Better than 97dB
Wow & Flutter	Unmeasurable
Channel separation	Better than 95dB (1kHz)
Output voltage/Impedance	
LINE OUT	2V/600 ohm (at full scale: 0dB)
Headphone output (Headphone: 8 ohms)	370mV
▪ GENERAL	
Power requirements	
U.S. & Canadian Models	120V AC, 60Hz
Australian model	240V AC, 50Hz
European Model	240V·220V AC, 50Hz
General Model	110V ～130V/220V ～240V AC, 50/60Hz
Power consumption	20W
Dimensions (W x H x D)	435 x 94 x 290 (17-1/8 x 3-11/16 x 11-7/16)
Weight	5.2 kg (11 lbs. 7 oz.)
Accessories	Pin plug cord Remote Control Transmitter RS-D20 Two dry-cell penlight batteries (AA: R6)

*Specification subject to change without notice.

CD-2000M

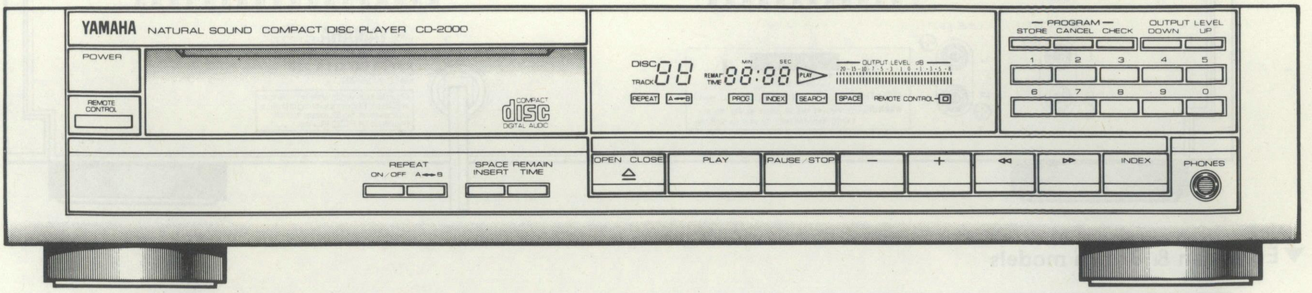
Format	Compact disc digital audio system
▪ AUDIO SECTION	
Frequency response	2Hz – 20kHz +0.3/–0.3dB
Harmonic distortion	Less than 0.0015% (1kHz) (IEC-A-Network)
Harmonic distortion + noise	Less than 0.0025% (1kHz) (IEC-A-Network)
S/N ratio	
IEC FLAT	96dB
IEC A	102dB
Dynamic range	Better than 97dB
Wow & Flutter	Unmeasurable
Channel separation	Better than 95dB (1kHz)
Output voltage/Impedance	
LINE OUT	2V/600 ohm (at full scale: 0dB)
BALANCE OUT	20dBm/150 ohm (600 ohm Load)
Headphone output (Headphone: 8 ohms)	370mV
▪ GENERAL	
Power requirements	
U.S. & Canadian Models	120V AC, 60Hz
Australian Model	240V AC, 50Hz
European Model	240V·220V AC, 50Hz
Power consumption	20W
Dimensions (W x H x D)	435 x 94 x 290 (17-1/8 x 3-11/16 x 11-7/16)
Weight	5.5 kg (12 lbs. 2 oz.)
Accessories	Pin plug cord Remote Control Transmitter RS-D20 Two dry-cell penlight batteries (AA: R6)

*Specification subject to change without notice.

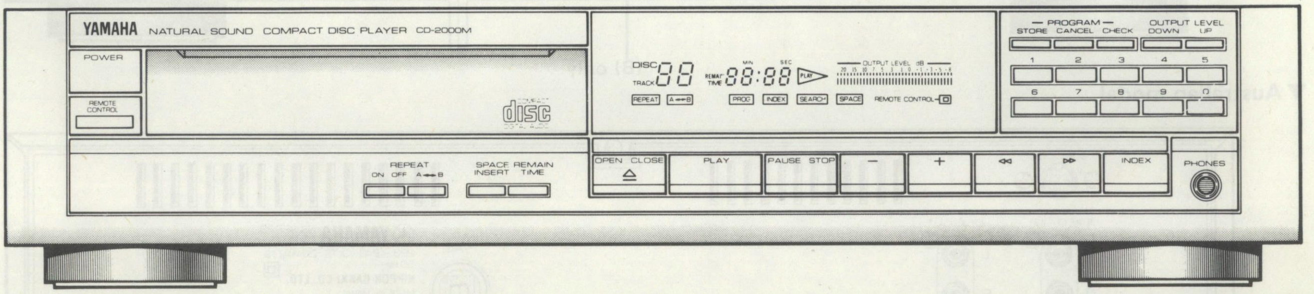
(U) ..... U.S.A. model (C) ..... Canadian model (B) ..... British model (A) ..... Australian model (G) ..... European model (R) ..... Other model (W) ..... Germany model

PANEL LAYOUT

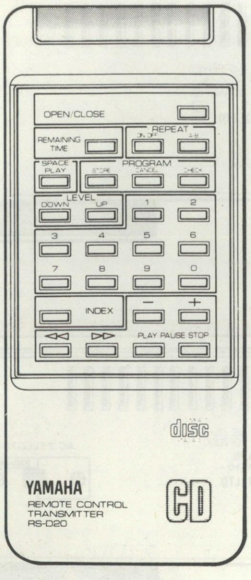
● CD-2000



● CD-2000M



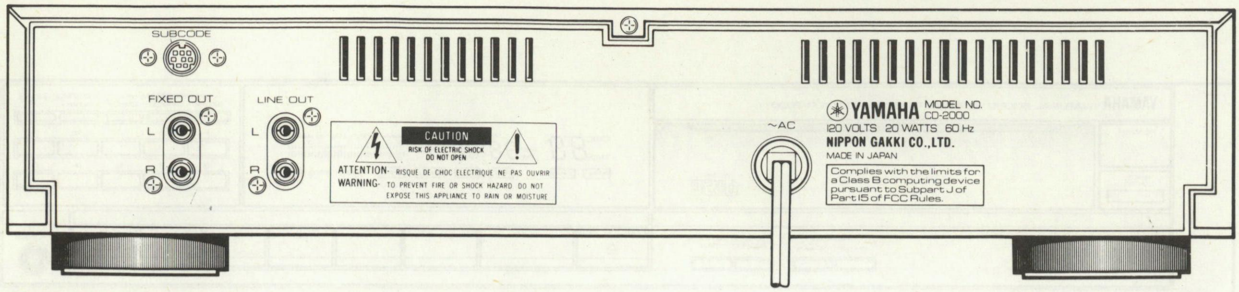
● RS-D20



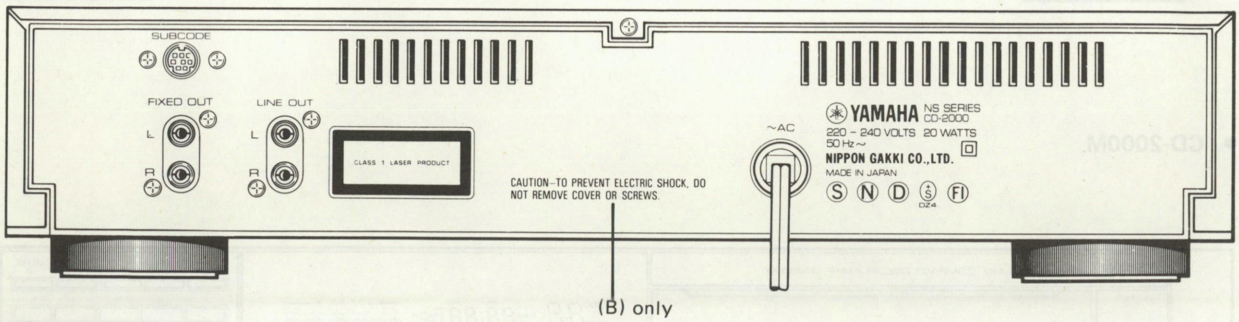
REAR PANELS

CD-2000

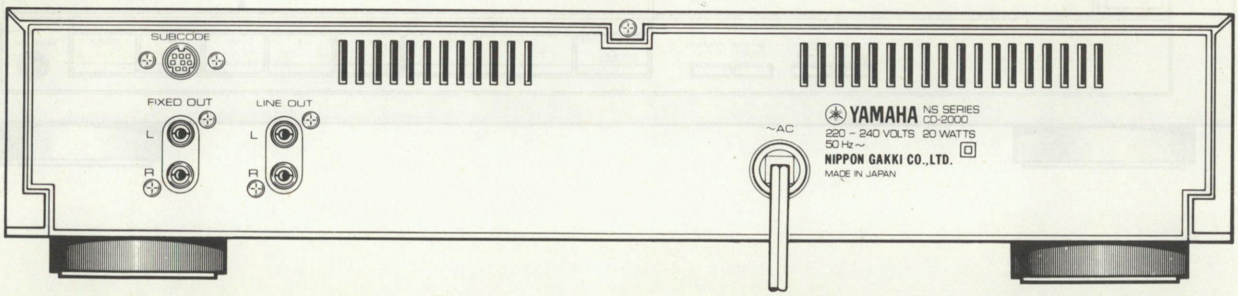
▼ U.S.A. & Canadian models



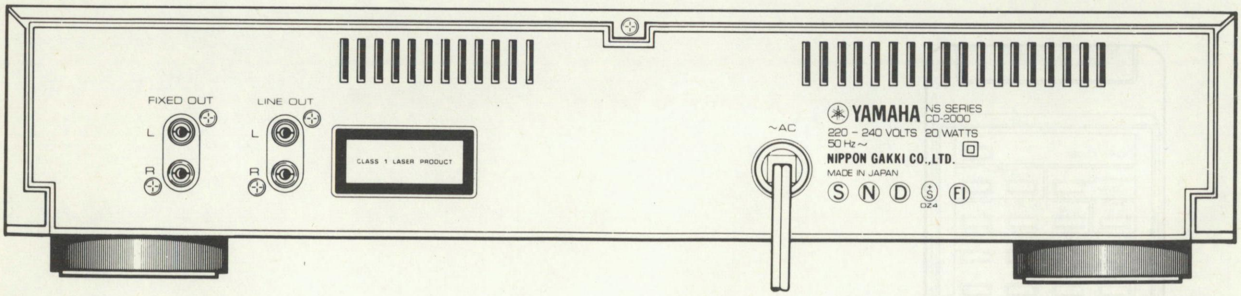
▼ European & British models



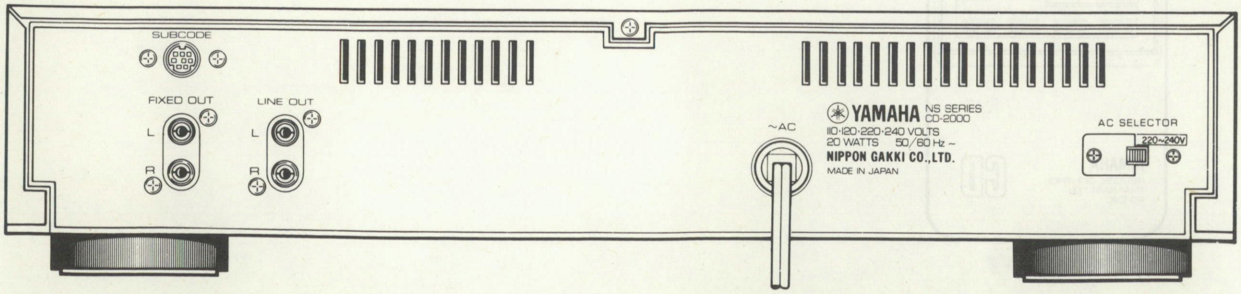
▼ Australian model



▼ Germany model

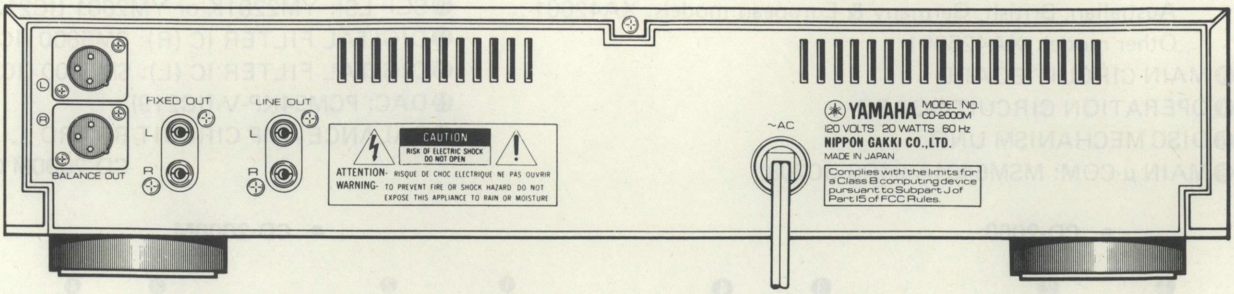


▼ Other model

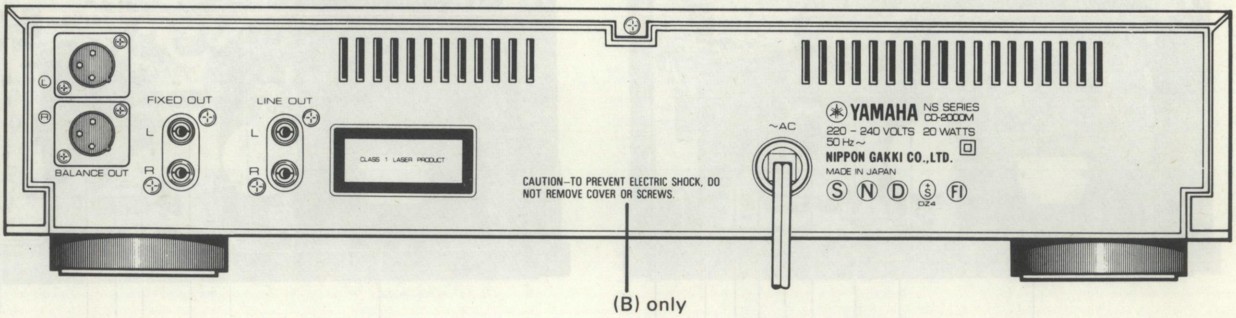


CD-2000M

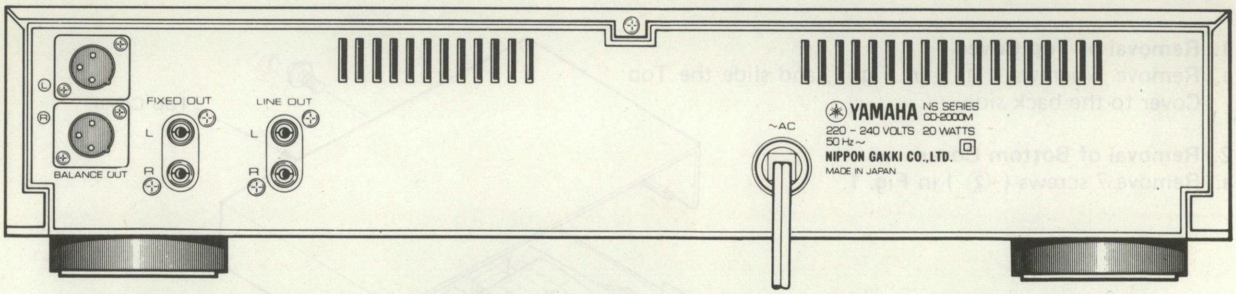
▼U.S.A. & Canadian models



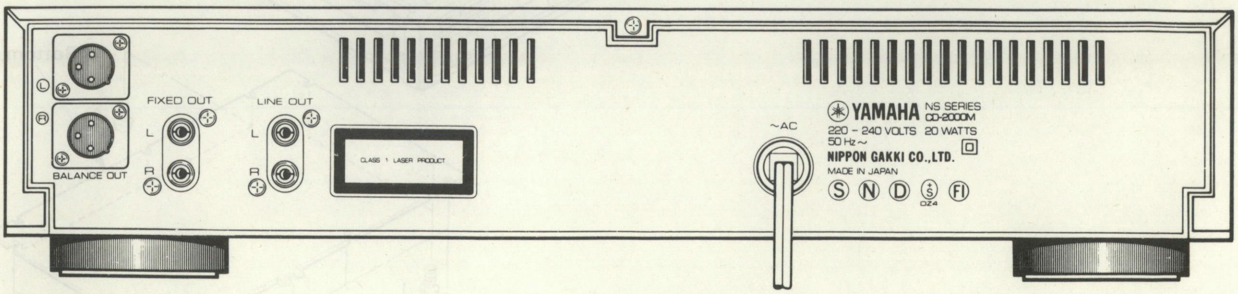
▼European & British models



▼Australian model



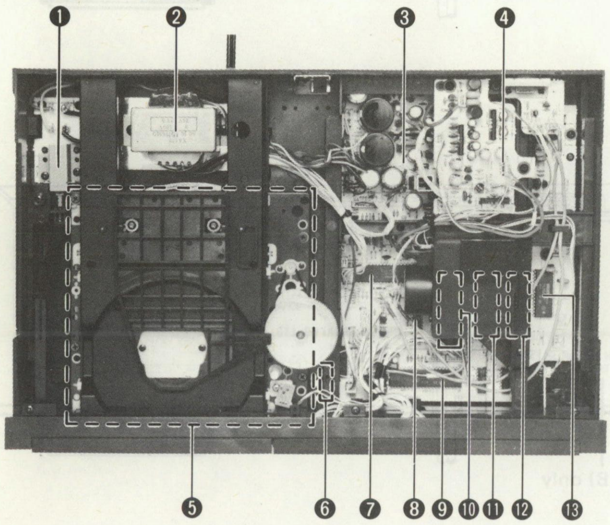
▼Germany model



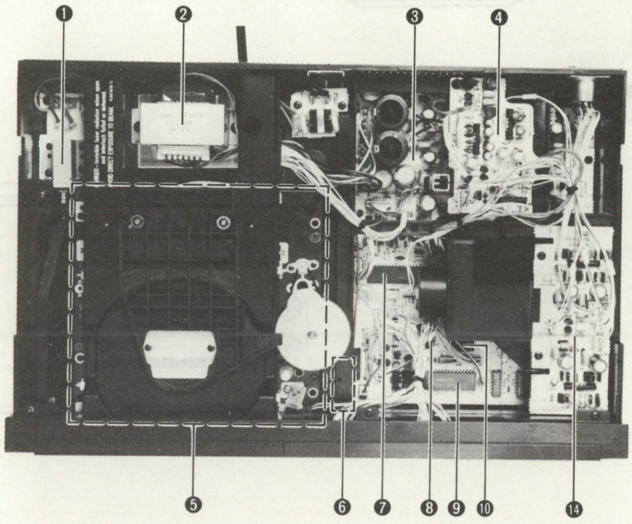
INTERNAL VIEW

❶ POWER SWITCH
❷ POWER TRANSFORMER
U.S.A. & Canadian models: XA423001
Australian, British, Germany & European models: XA42001
Other model: XA425001
❸ MAIN CIRCUIT BOARD
❹ OPERATION CIRCUIT BOARD
❺ DISC MECHANISM UNIT
❻ MAIN μ-COM: MSM6404A-94RS (IC208)
❼ SVC LSI: YM3531 or YM3811 (IC203)
❽ RAM: HM6116ASP-20 (IC210)
❾ KEY μ-COM: LM6405A-404 (IC209)
❿ SGP LSI: YM2201K or YM2601 (IC212)
⓫ DIGITAL FILTER IC (R): SM5800 (IC216)
⓬ DIGITAL FILTER IC (L): SM5800 (IC215)
⓭ DAC: PCM54KP-V (IC219)
⓮ BALANCE AMP CIRCUIT BOARD ... CD-2000M ONLY

• CD-2000



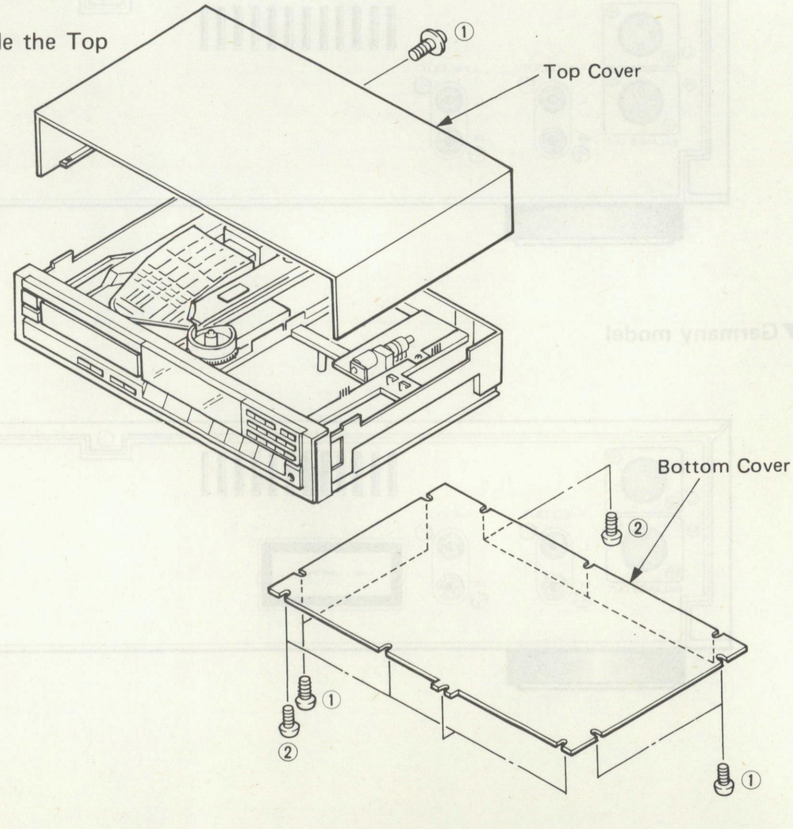
• CD-2000M



DISASSEMBLY PROCEDURES (Remove parts in disassembly order as numbered)

1. Removal of Top Cover
a. Remove 5 screws (①) in Fig. 1, and slide the Top Cover to the back side.

2. Removal of Bottom Cover
a. Remove 7 screws (②) in Fig. 1.



3. Removal of DISC Tray Ass'y

a. Lift Flapper as shown in Fig. 2, and pull Disc Tray Ass'y forward.
Then pull off Disc Tray Ass'y by pressing the hook Ⓐ in Fig. 3. Now, the azimuth can be adjusted.

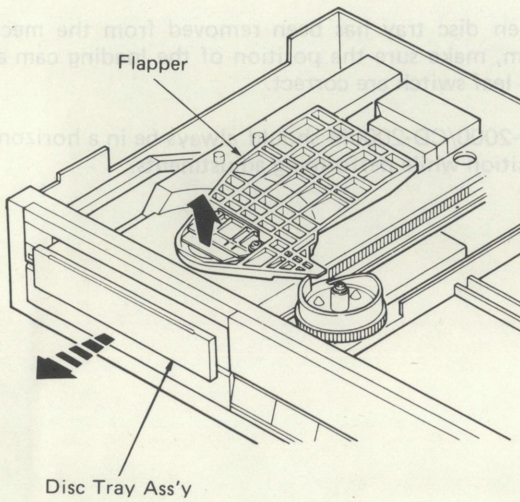


Fig. 2

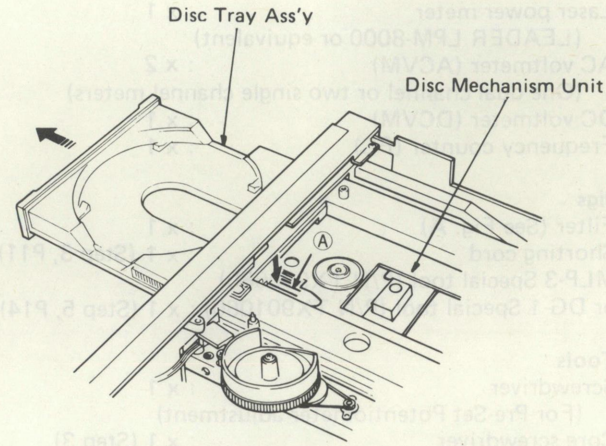


Fig. 3

4. Removal of DISC Mechanism Unit

a. Remove 4 screws (③) in Fig. 4.

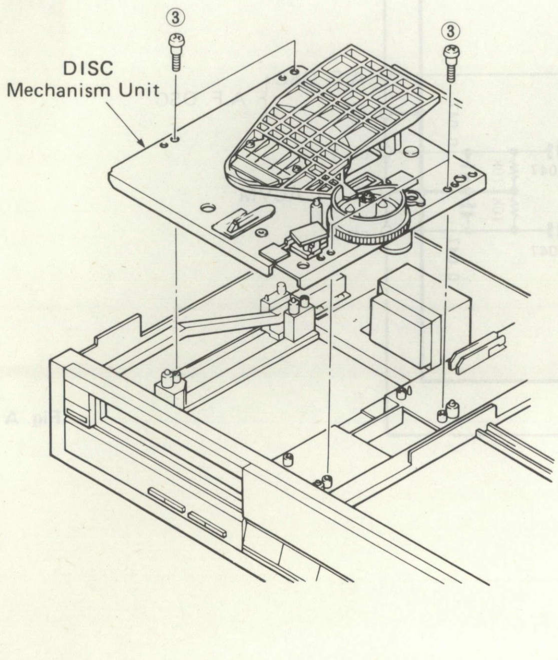


Fig. 4

5. Removal of Flapper

a. Loosen screw (④) fixing Flapper in Fig. 5 and then remove the Flapper.

6. Removal of Cam

a. Remove screw (⑤) in Fig. 5 and then pull up the Cam.

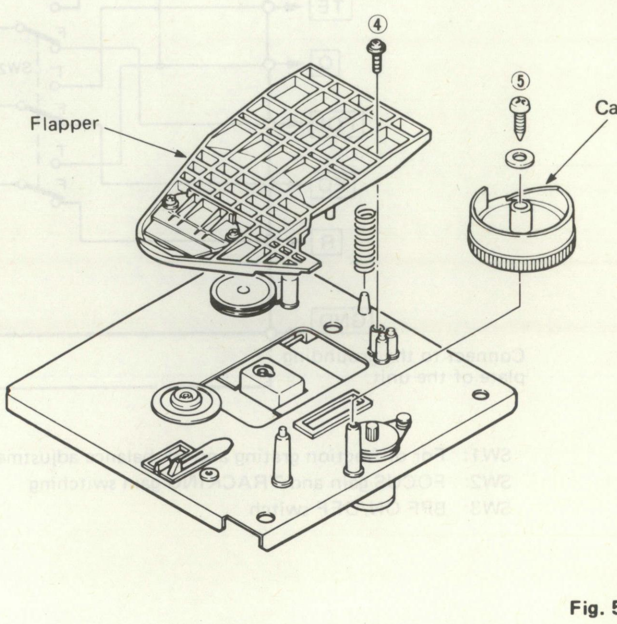


Fig. 5

■ ADJUSTMENTS

• Necessary items

Measuring instruments

Oscilloscope : x 2
(At least one shall have a bandwidth of 50 MHz or more)
Audio frequency oscillator (A.F.OSC): x 1
Laser power meter : x 1
(LEADER LPM-8000 or equivalent)
AC voltmeter (ACVM) : x 2
(One dual channel or two single channel meters)
DC voltmeter (DCVM) : x 1
Frequency counter (FC) : x 1

Jigs

Filter (See Fig. A) : x 1
Shorting cord : x 1 (Step 3, P11)
MLP-3 Special tool (P/N TX900680)
or DG-1 Special tool (P/N TX901060) : x 1 (Step 5, P14)

Tools

Screwdriver : x 1
(For-Pre-Set Potentiometer adjustment)
Core screwdriver : x 1 (Step 3)

• Precautions or Special Notes

1. Measure the output level at the output terminal of the AF oscillator.
2. The [HS] terminal used for the measurement in Step 3, 4, 5 and 7 is not at connector #7 but the emitter of TR202 or (+) lead of C203.
3. When disc tray has been removed from the mechanism, make sure the position of the loading cam and the leaf switch are correct.
4. CD-2000/CD-2000M should always be in a horizontal position while performing adjustments.

• Adjustment jig (with internal filter)

Connect the filter in Fig. A before measurement.

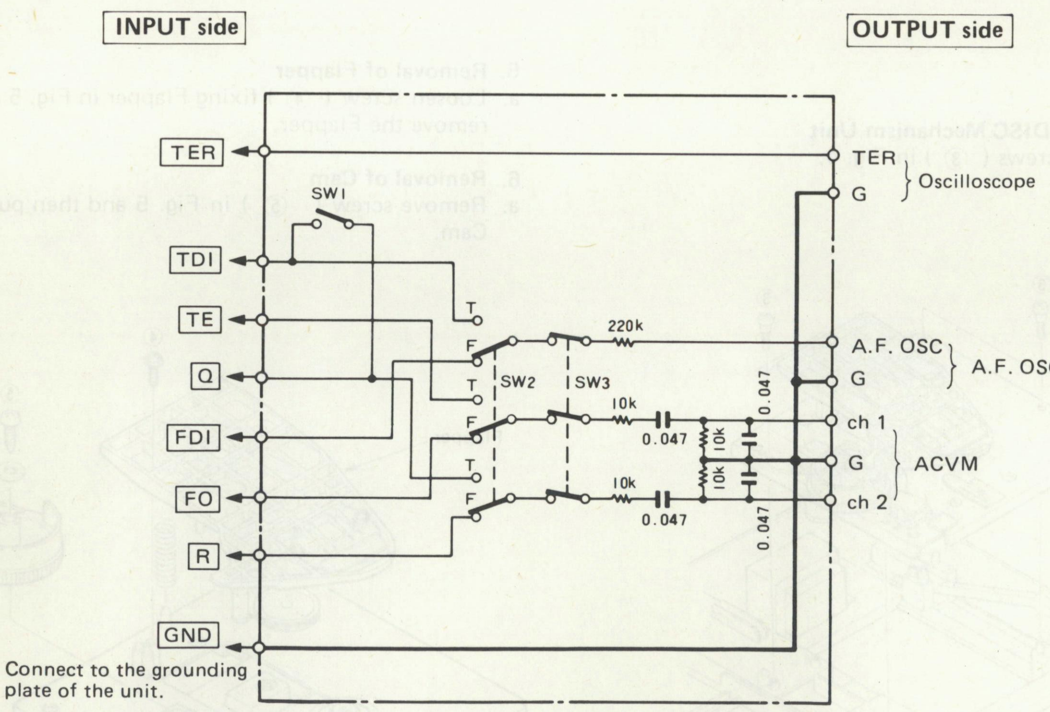
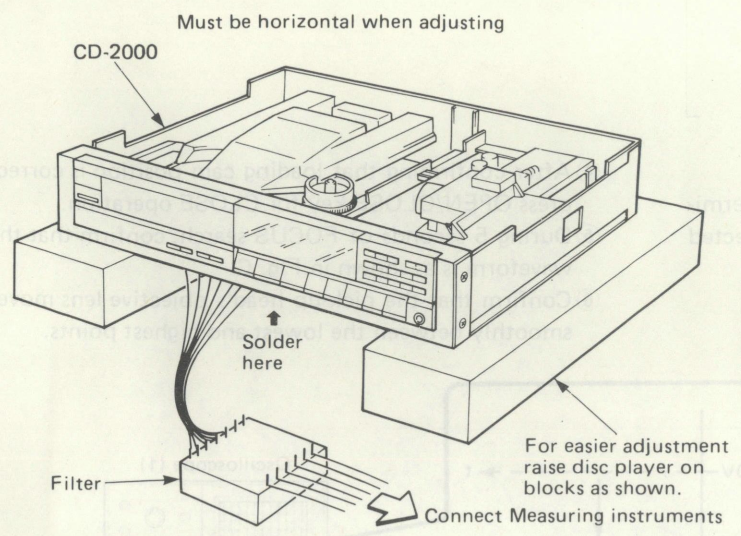


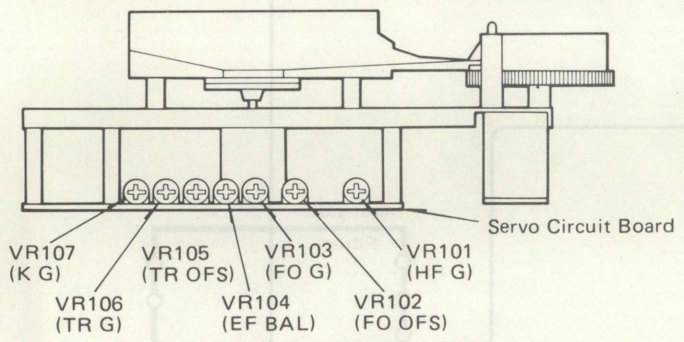
Fig. A

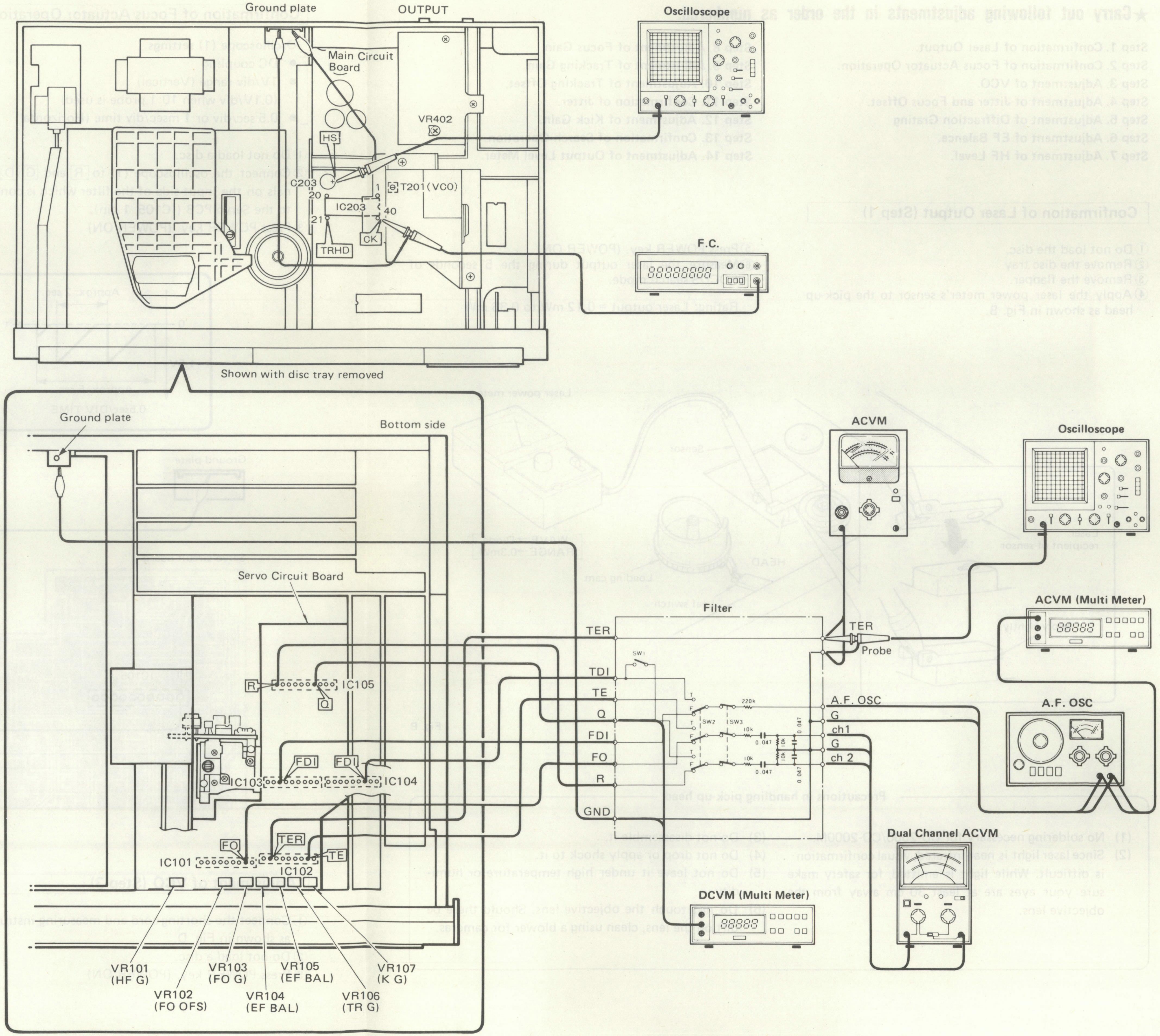
SW1: For diffraction grating and EF balance adjustments
SW2: FOCUS gain and TRACKING gain switching
SW3: BPF ON/OFF switch

• Adjustment wiring diagram/test points

(Before adjustment, solder input leads of filter to fasilitate.)







★Carry out following adjustments in the order as numbered.

Step 1. Confirmation of Laser Output.
Step 2. Confirmation of Focus Actuator Operation.
Step 3. Adjustment of VCO.
Step 4. Adjustment of Jitter and Focus Offset.
Step 5. Adjustment of Diffraction Grating
Step 6. Adjustment of EF Balance.
Step 7. Adjustment of HF Level.
Step 8. Adjustment of Focus Gain.
Step 9. Adjustment of Tracking Gain.
Step 10. Adjustment of Tracking Offset.
Step 11. Confirmation of Jitter.
Step 12. Adjustment of Kick Gain.
Step 13. Confirmation of Search Operation.
Step 14. Adjustment of Output Level Meter.

Confirmation of Laser Output (Step 1)

① Do not load the disc.
② Remove the disc tray
③ Remove the flapper.
④ Apply the laser power meter's sensor to the pick-up head as shown in Fig. B.
⑤ Press POWER key. (POWER ON)
⑥ Measure the laser output during the 5 seconds of FOCUS search mode.

Rating: Laser output = 0.12 mW to 0.36 mW

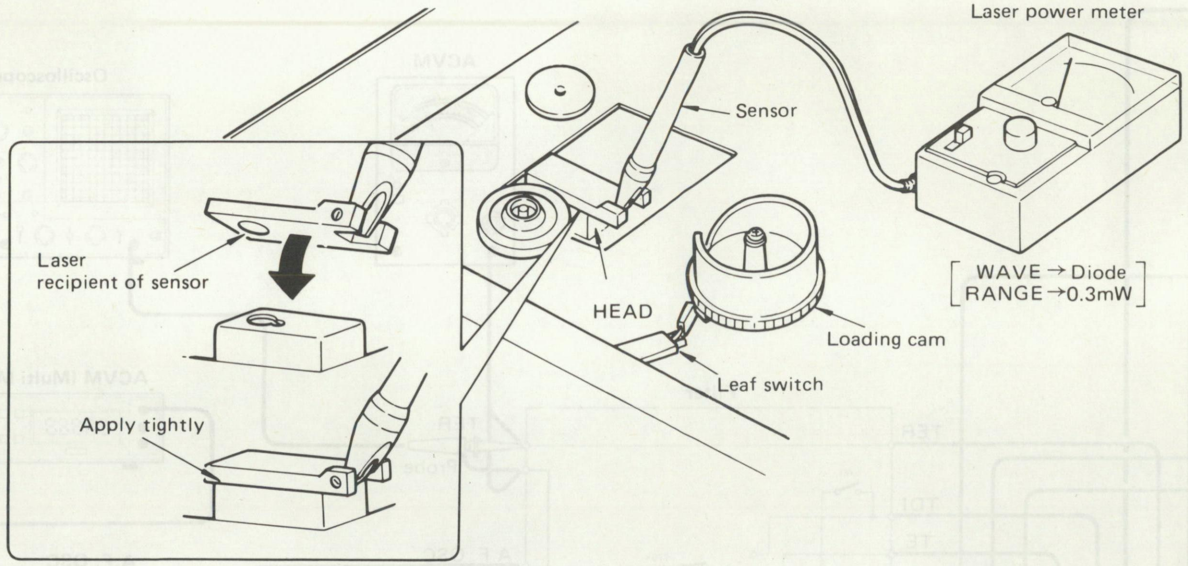


Fig. B

Precautions in handling pick-up head

(1) No soldering necessary for CD-2000/CD-2000M.
(2) Since laser light is near-infrared, visual confirmation is difficult. While light is emitted, for safety make sure your eyes are at least 30 cm away from the objective lens.
(3) Do not disassemble it.
(4) Do not drop or apply shock to it.
(5) Do not leave it under high temperature or humidity.
(6) Do not touch the objective lens. Should there be dirt on the lens, clean using a blower for cameras.

Confirmation of Focus Actuator Operation (Step 2)

Oscilloscope (1) settings

- DC coupling
- 1V/div range (Vertical)
  (0.1V/div when 10:1 probe is used)
- 0.5 sec/div or 1 msec/div time (Horizontal)

① Do not load a disc.
② Connect the oscilloscope (1) to [R] and [GND] terminals on the input side of the filter which is connected to the Servo PCB (IC105, 1 pin).
③ Press POWER key. (POWER ON)
④ After confirming that loading cam position is correct press OPEN/CLOSE key for CLOSE operation.
⑤ During 5 seconds of FOCUS search, confirm that the waveform is as shown in Fig. C.
⑥ Confirm that the pick-up head's objective lens moves smoothly between the lowest and highest points.

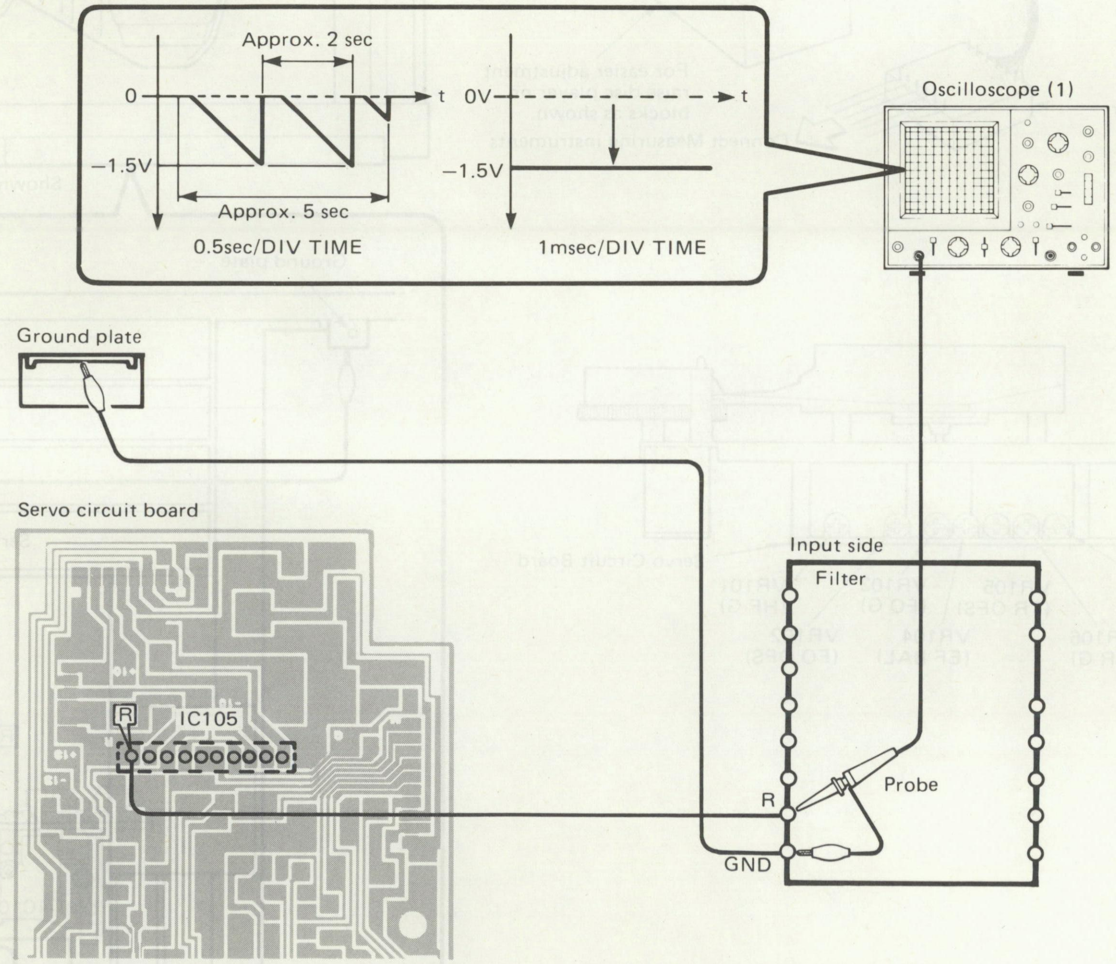


Fig. C

Adjustment of VCO (Step 3)

① Connect the shorting cord and measuring instruments, as shown in Fig. D.
② Do not load a disc.
③ Press POWER key. (POWER ON)
④ While observing the frequency counter indication (FVCO), adjust T201 so that it satisfies the rating.

Rating: FVCO = 4.3218 MHz ± 10 kHz

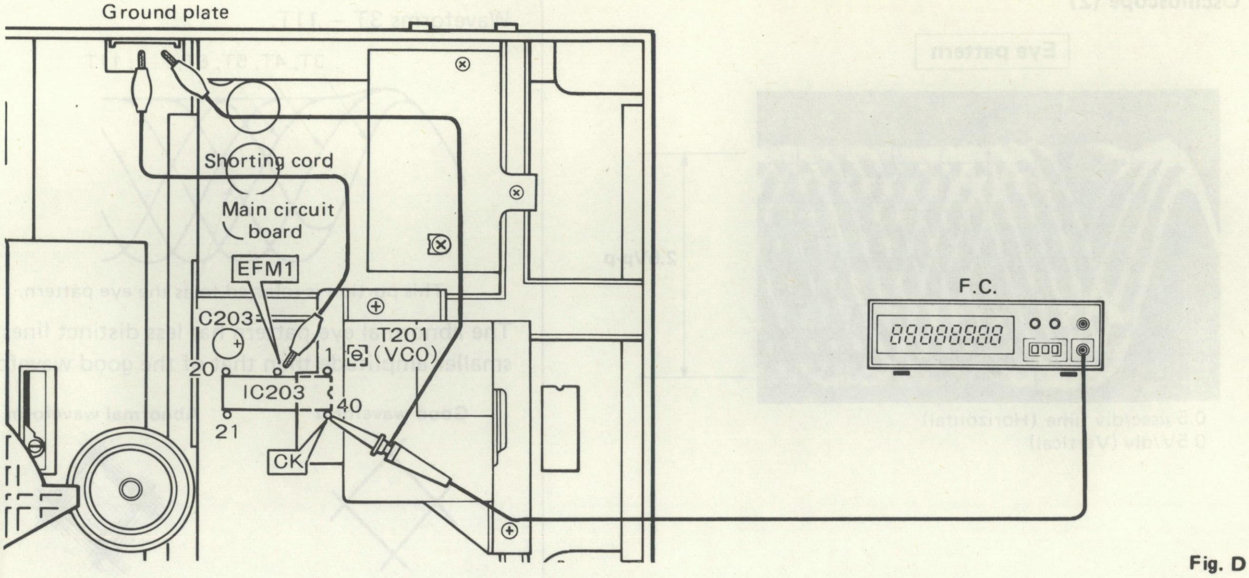


Fig. D

Adjustment of Jitter and Focus Offset (Step 4)

Oscilloscope (2) Settings

- AC coupling
- 0.5 V/div range (Vertical)
  (50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μsec/div time (Horizontal)

① Remove the disc tray.
② Connect oscilloscope (2) to HS terminal (+ lead of C202), as shown in Fig. E.
③ Press POWER key. (POWER ON)
④ Load the specified disc (35DH5 or Philips test disc).
⑤ Confirm that the loading cam position is correct and press OPEN/CLOSE key for CLOSE operation.
⑥ Press PLAY key.
⑦ Adjust the head base tilting screw so that the HS signal (eye-pattern) waveform is distinct and clear.
* Adjust at the center of the disc.
⑧ Adjust VR102 (FOCUS OFFSET) so that the HS (eye-pattern) signal waveform is distinct and clear.
*Adjust at the center of the disc.

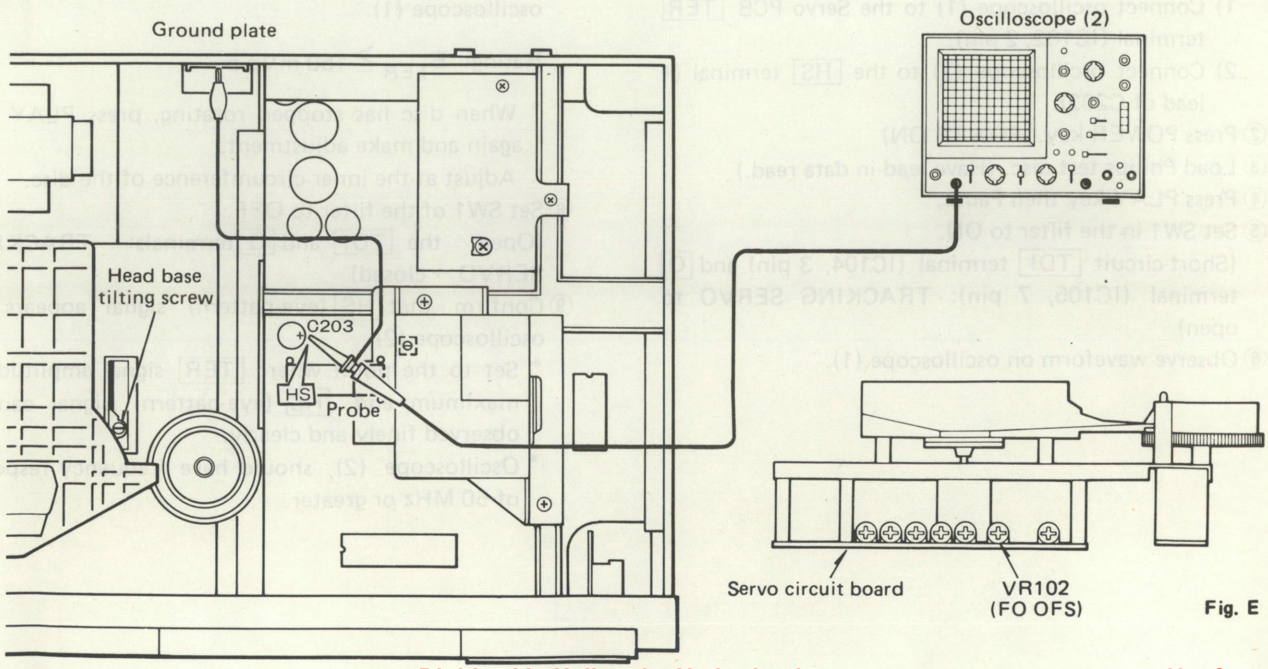
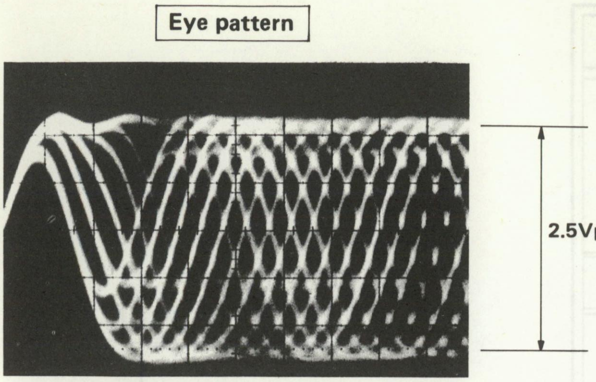
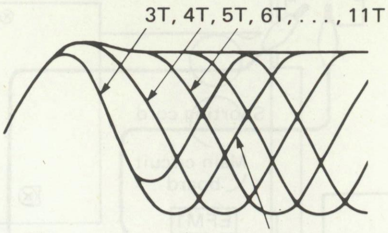


Fig. E

Oscilloscope (2)



0.5 μsec/div time (Horizontal)
0.5V/div (Vertical)



Adjustment of Diffraction Grating (Step 5)

* This adjustment requires use of 2 oscilloscopes.

* Power should not be turned OFF during steps ② through ⑨.

Oscilloscope (1) setting conditions

- DC coupling
- 0.1V/div range (Vertical)
  (10 mV/div when 10:1 probe is used)
- 5 to 20 msec/div time (Horizontal)

① Connect the filter and measuring instruments, as shown in Fig. F.
  1) Connect oscilloscope (1) to the Servo PCB [TER] terminal (IC102, 2 pin).
  2) Connect oscilloscope (2) to the [HS] terminal (+ lead of C202).

② Press POWER key. (POWER ON)

③ Load Philips test disc. (Have lead-in data read.)

④ Press PLAY key then Pause.

⑤ Set SW1 in the filter to ON.
(Short-circuit [TDI] terminal (IC104, 3 pin) and [Q] terminal (IC105, 7 pin): TRACKING SERVO to open)

⑥ Observe waveform on oscilloscope (1).

Oscilloscope (2) setting conditions

- AC coupling
- 0.5V/div range (Vertical)
  (50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μsec/div time (Horizontal)

⑦ Using the special tool (See P. 15) adjust diffraction grating for maximum signal amplitude [TER] at oscilloscope (1).

Rating: $E_{TER} \geqq 150$ mVp-p

* When disc has stopped rotating, press PLAY key again and make adjustment.

* Adjust at the inner circumference of the disc.

⑧ Set SW1 of the filter to OFF.
(Open the [TDI] and [Q] terminals: TRACKING SERVO → closed)

⑨ Confirm that [HS] (eye-pattern) signal appears on oscilloscope (2).

* Set to the point where [TER] signal amplitude is maximum and [HS] (eye-pattern) signal can be observed finely and clearly.

* Oscilloscope (2), should have frequency response of 50 MHz or greater.

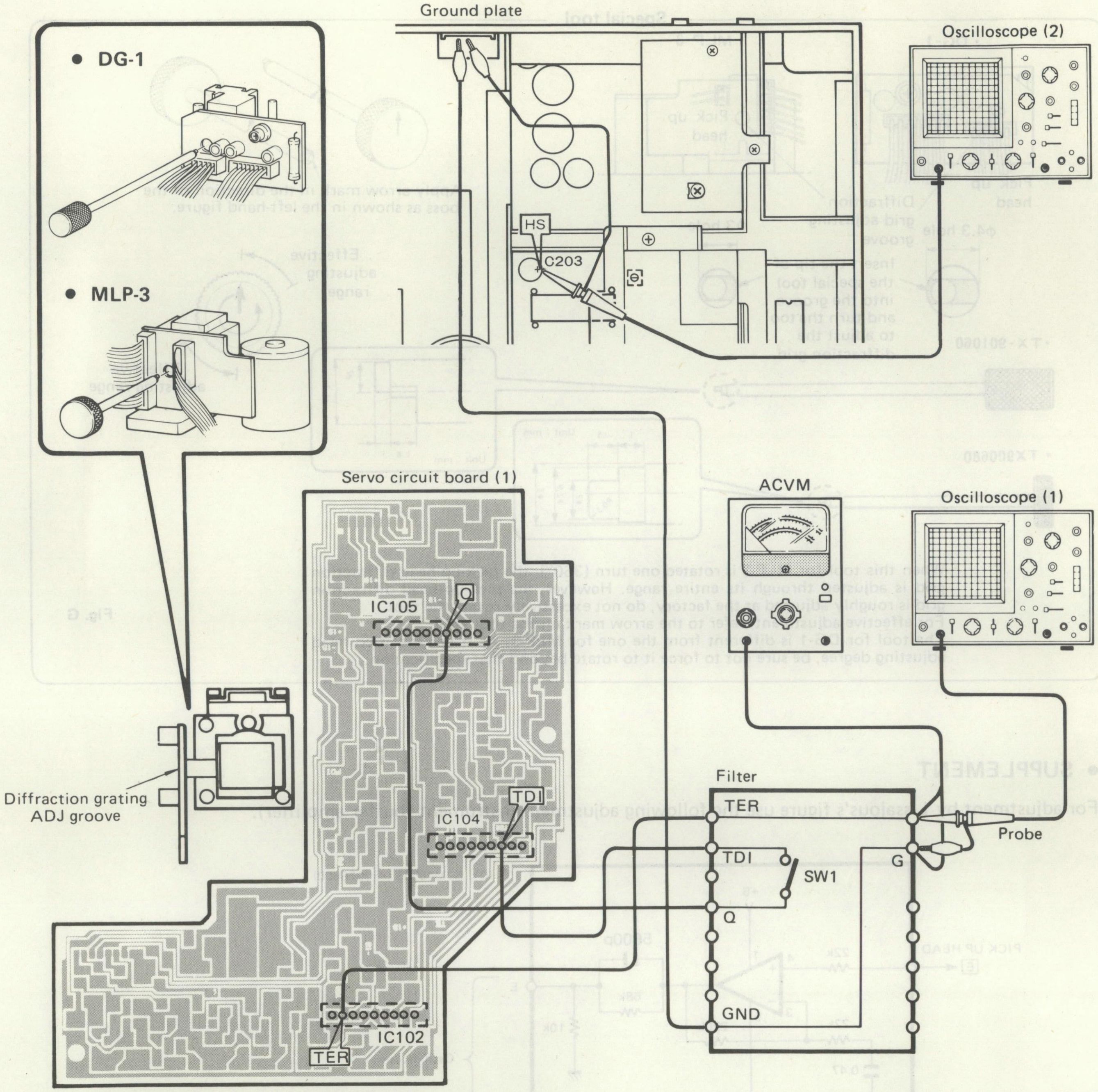
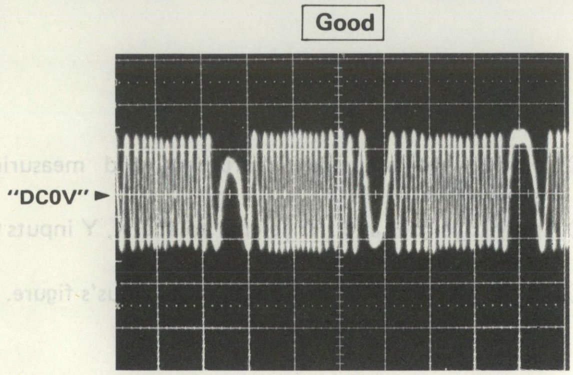


Fig. F

Oscilloscope (1)



TER signal amplitude in this state is 250mVp-p.

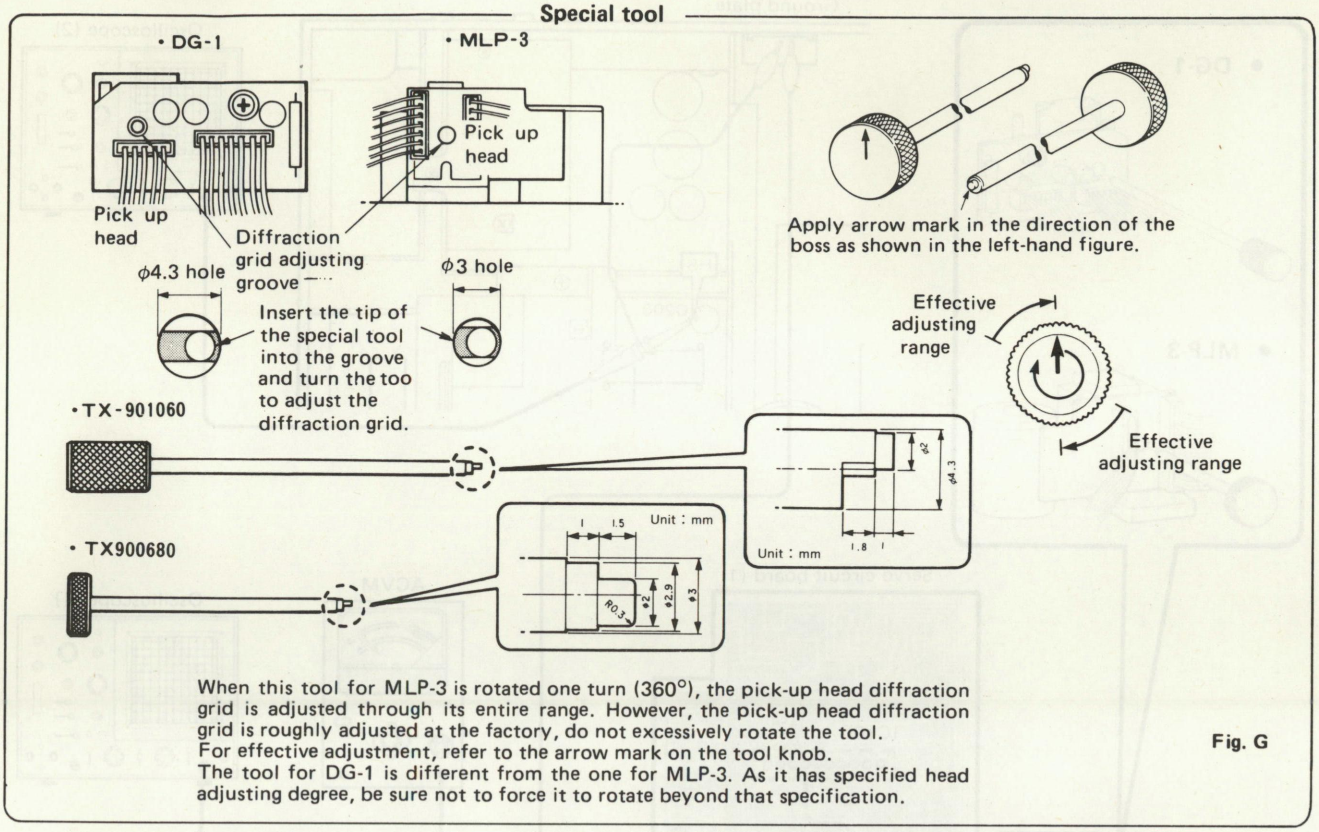
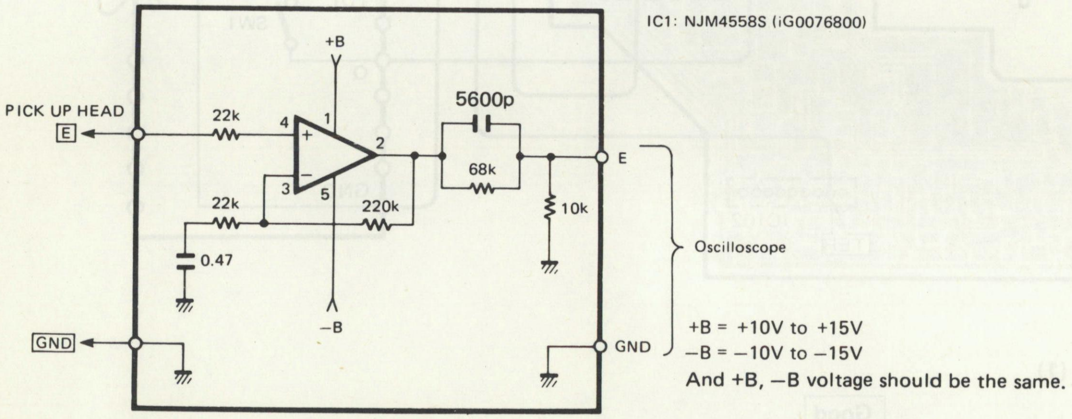


Fig. G

• SUPPLEMENT

For adjustment by Lissajous's figure use the following adjustment instrument (buffer amplifier).



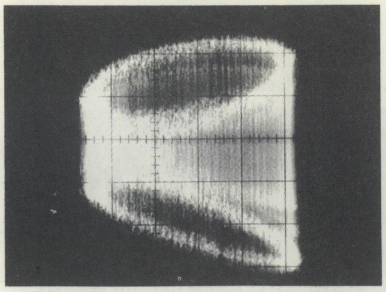
* The buffer amplifier is used only for this adjustment.
Don't leave it connected in other adjustments.

Oscilloscope (1) settings

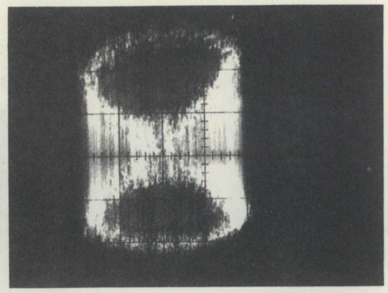
- DC coupling
- X input → [E] signal: 50mV/div (Vertical)
  (5mV/div when 10:1 probe is used)
- Y input → [HF] signal: 500mV/div (Vertical)
  (50mV/div is when 10:1 probe is used)
- MODE → X−Y

① Connect the adjusting instrument and measuring instrument.
② Apply [E] signal and [HF] signal to the X, Y inputs of the oscilloscope respectively.
③ Set the mode to X-Y and observe Lissajous's figure. Make the lower ellipse horizontal.

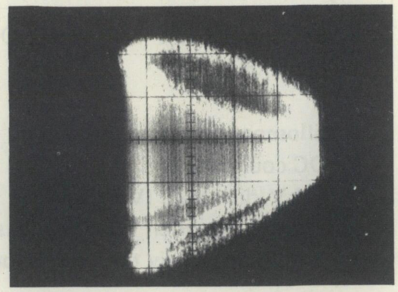
Incorrect



Good



Incorrect



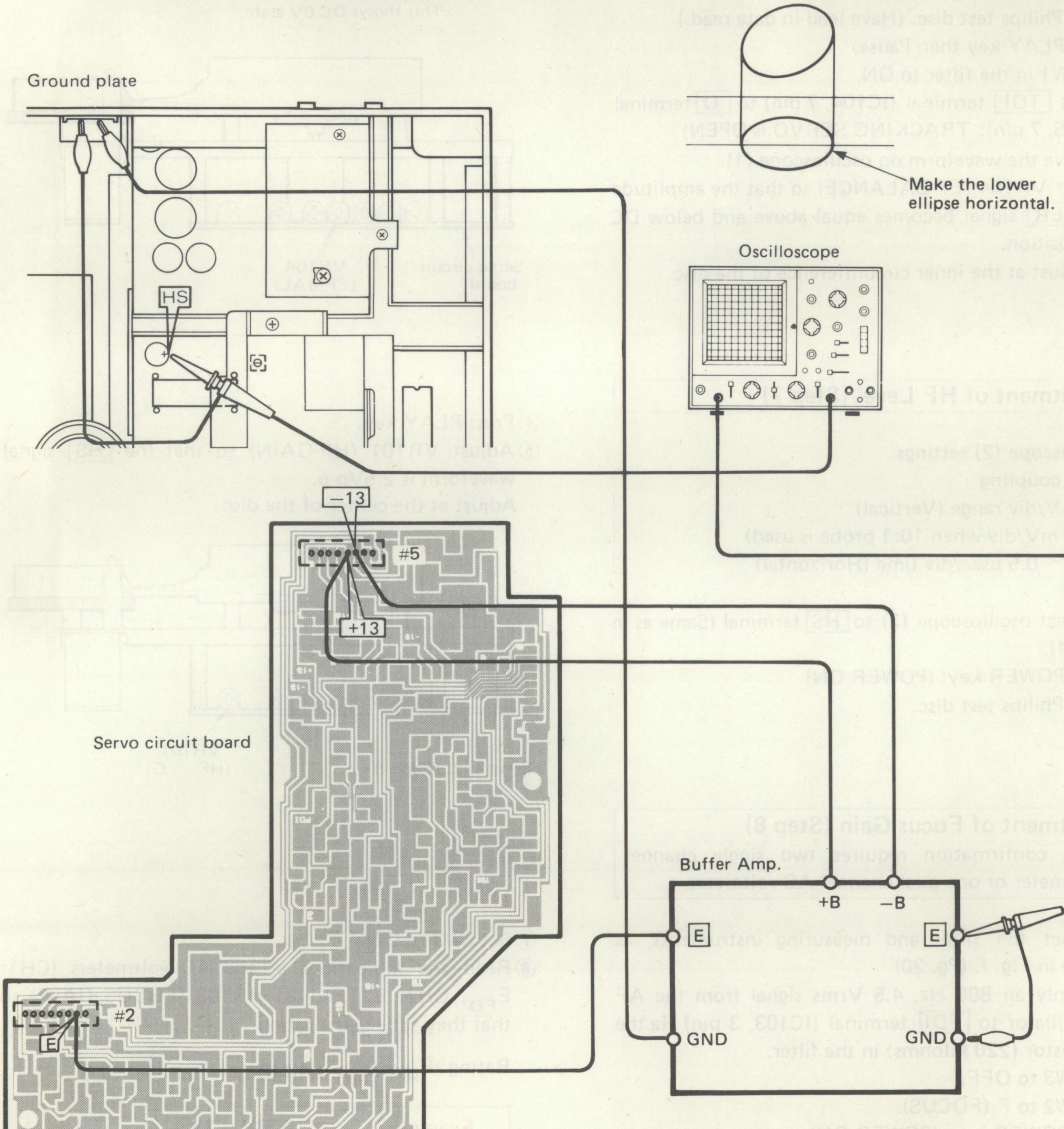


Fig. H

Adjustment of EF Balance (Step 6)

* Power should not be turned OFF during steps ② through ⑧ .

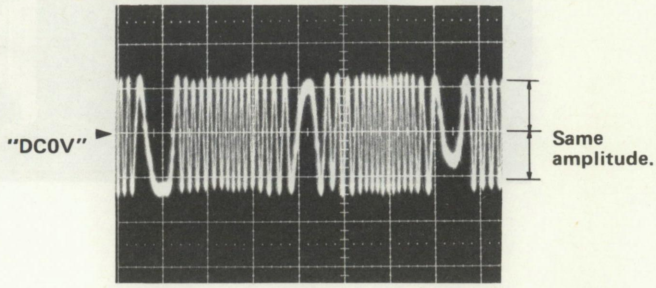
Oscilloscope (1) settings

- DC coupling
- 0.1 V/div range (Vertical) (10mV/div when 10:1 probe is used)
- 1 to 20 msec/div time (Horizontal)

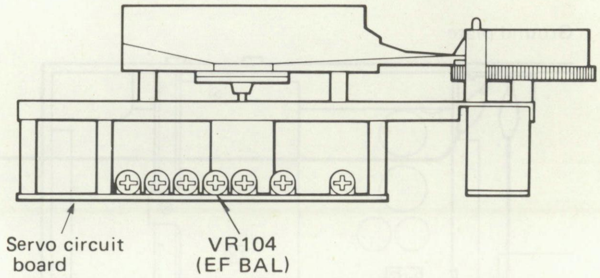
① Connect the filter and measuring instruments as in Step 5.
② Press POWER key. (POWER ON)
③ Load Philips test disc. (Have lead-in data read.)
④ Press PLAY key then Pause.
⑤ Set SW1 in the filter to ON.
(Short [TDI] terminal (IC104, 7 pin) to [Q] terminal (IC105, 7 pin): TRACKING SERVO is OPEN)
⑥ Observe the waveform on oscilloscope (1).
⑦ Adjust VR104 (EF BALANCE) so that the amplitude of [TER] signal becomes equal above and below DC 0V position.
* Adjust at the inner circumference of the disc.

Good

Rating DC offset → Less than ±15mV.



This shows DC 0V state.

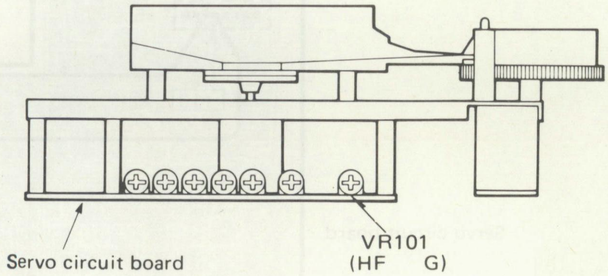


Adjustment of HF Level (Step 7)

Oscilloscope (2) settings

- AC coupling
- 0.5 V/div range (Vertical) (50 mV/div when 10:1 probe is used)
- 0.2 ~ 0.5 μsec/div time (Horizontal)

① Connect oscilloscope (2) to [HS] terminal (Same as in Step 4).
② Press POWER key. (POWER ON)
③ Load Philips test disc.
④ Press PLAY key.
⑤ Adjust VR101 (HF-GAIN) so that the [HS] signal waveform is 2.5Vp-p.
Adjust at the center of the disc.



Adjustment of Focus Gain (Step 8)

* This confirmation requires two single channel voltmeter or one dual channel AC voltmeter.

① Connect the filter and measuring instruments, as shown in Fig. I. (Pg. 20)
Apply an 800 Hz, 4.5 Vrms signal from the AF oscillator to [FDI] terminal (IC103, 3 pin) via the resistor (220 kilohms) in the filter.
② Set SW3 to OFF.
③ Set SW2 to F (FOCUS).
④ Press POWER key. (POWER ON)
⑤ Load Philips test disc.
⑥ Press PLAY key.
⑦ Set SW3 to ON.
⑧ Read the indications of the AC voltmeters (CH1: E_{FO}, CH2: E_R), adjust VR103 (FOCUS GAIN) so that they satisfy the rating.

Rating: $E_R = E_{FO} + 14dB$

Example	[0dBV = 1V]
E_{FO}	= −32dBV (19.5mV)
E_R	= −18dBV (130mV)

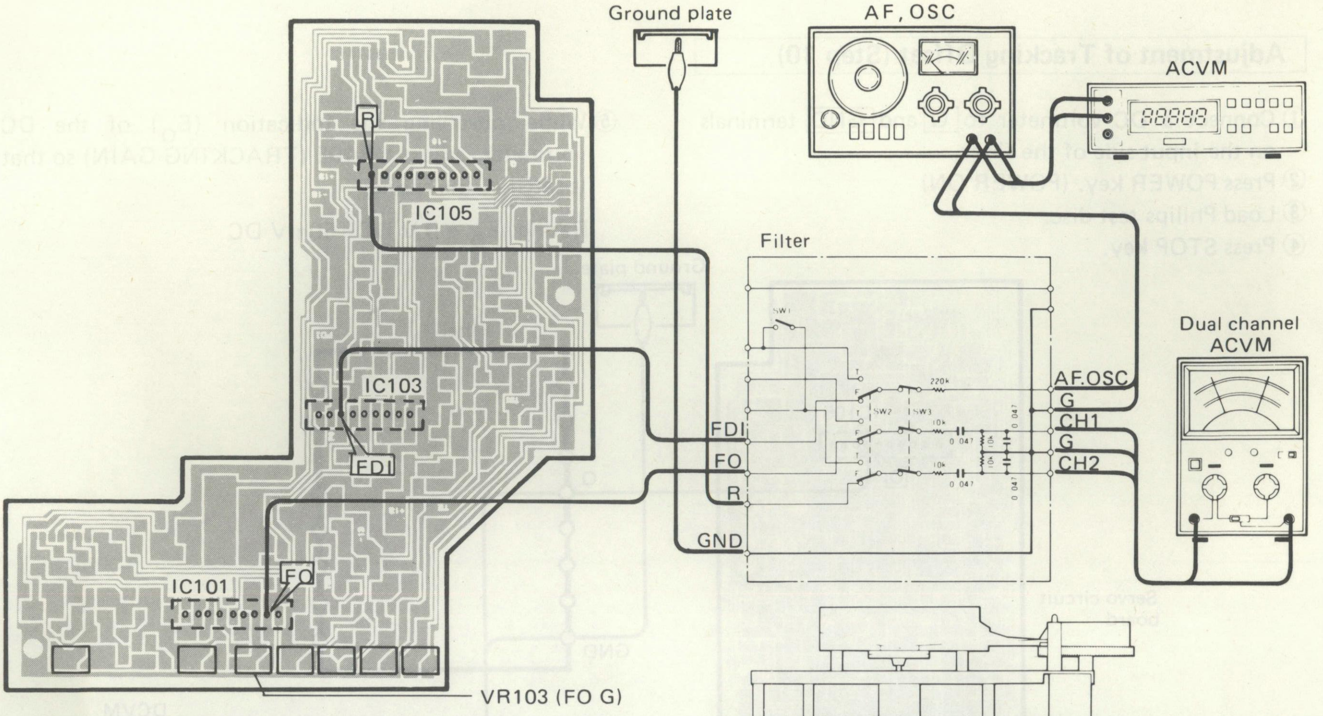


Fig. I

Adjustment of Tracking Gain (Step 9)

* This adjustment requires use of two single channel AC voltmeters or one dual channel AC voltmeter.

① Connect the filter and measuring instruments, as shown in Fig. J.
Apply a 800 Hz, 100 mVrms signal from the AF oscillator to [TDI] terminal (IC104, 8 pin) via the resistor (220 kilohms) in the filter.
② Set SW3 to OFF.
③ Set SW2 to T (TRACKING).
④ Press POWER key. (POWER ON)
⑤ Load Philips test disc.
⑥ Press PLAY key.
⑦ Set SW3 to ON.
⑧ While observing the indications of the AC voltmeters (CH1: E_{TE}, CH2: E_Q), adjust VR106 (TRACKING GAIN) so that they satisfy the rating.

Rating: $E_{TE} = E_Q + 9dB$

Example	[0dBV = 1V]
E_Q	= −19dBV (110mV)
E_{TE}	= −10dBV (250mV)

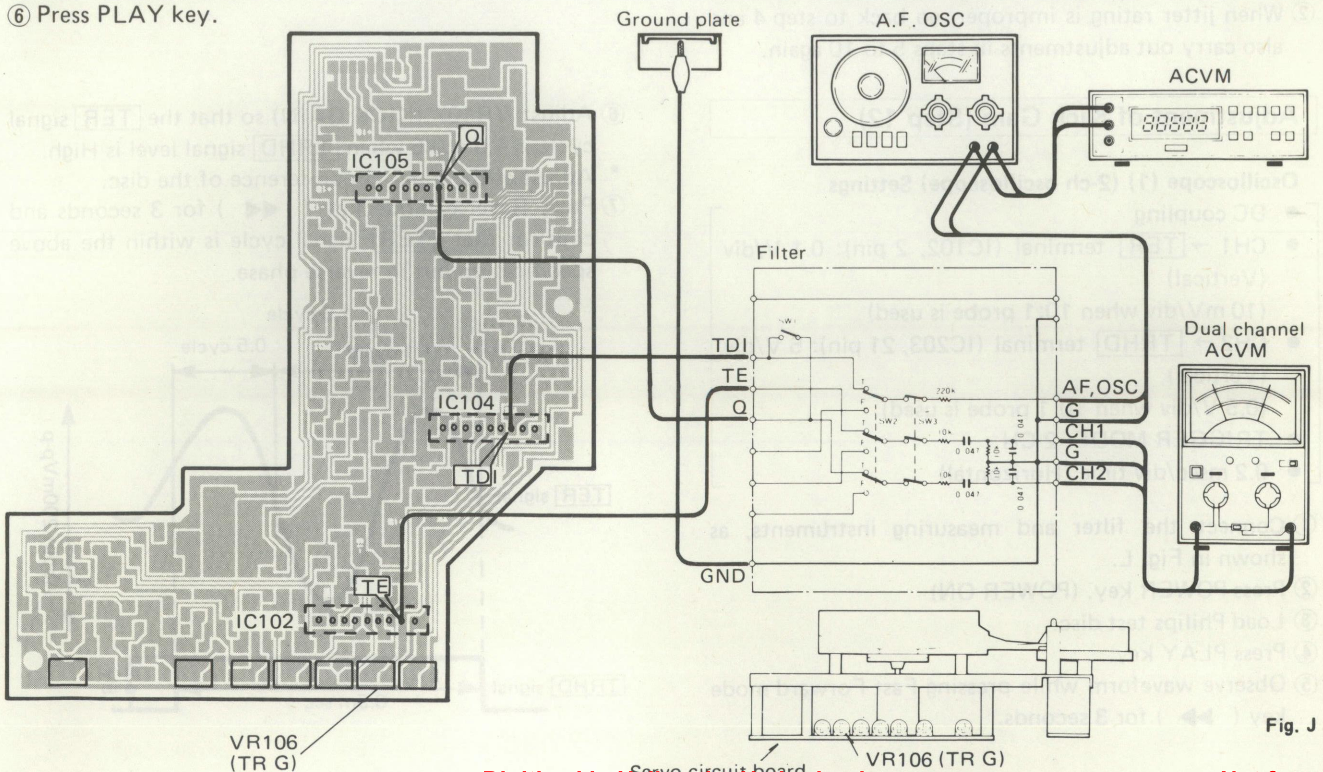


Fig. J

Adjustment of Tracking Offset (Step 10)

① Connect a DC voltmeter to [Q] and [GND] terminals on the Input side of the filter.
② Press POWER key. (POWER ON)
③ Load Philips test disc.
④ Press STOP key.
⑤ While observing the indication (E_Q) of the DC voltmeter, adjust VR105 (TRACKING GAIN) so that it satisfies the rating.

Rating: E_Q = 0 V DC ±50mV DC

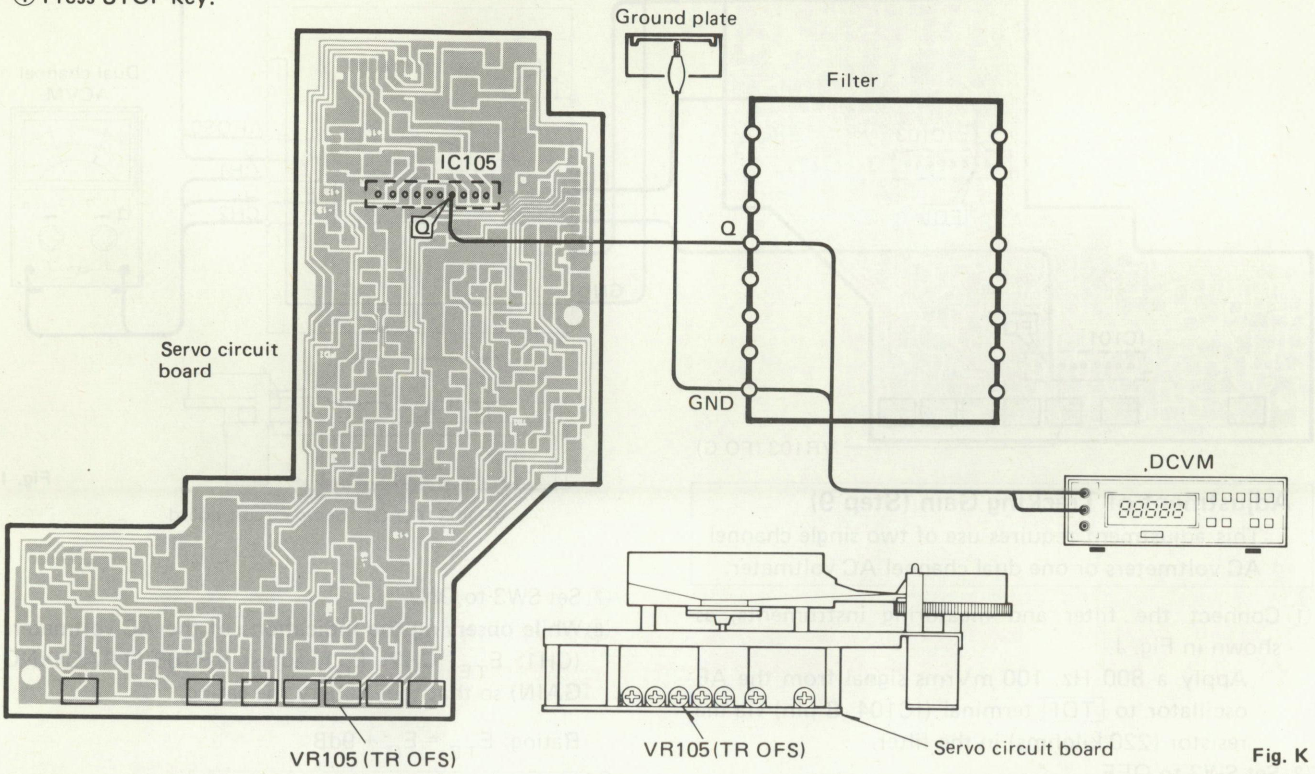


Fig. K

Confirmation of Jitter (Step 11)

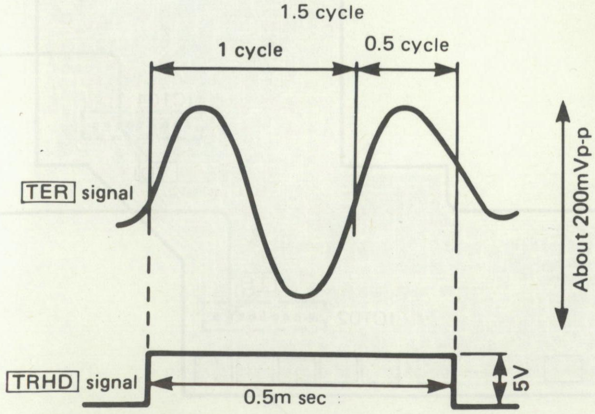
① Confirm jitter rating as in ⑦ of Step 4.
② When jitter rating is improper, go back to step 4 and also carry out adjustments in steps 5 to 10 again.

Adjustment of Kick Gain (Step 12)

Oscilloscope (1) (2-ch oscilloscope) Settings

- DC coupling
- CH1 → [TER] terminal (IC102, 2 pin): 0.1 V/div (Vertical) (10 mV/div when 10:1 probe is used)
- CH2 → [TRHD] terminal (IC203, 21 pin): 5 V/div (Vertical) (0.5 V/div when 10:1 probe is used)
- TRIGGER MODE: 2 CH
- 0.2 msec/div time (Horizontal)

① Connect the filter and measuring instruments, as shown in Fig. L.
② Press POWER key. (POWER ON)
③ Load Philips test disc.
④ Press PLAY key.
⑤ Observe waveform while pressing Fast Forward mode key (▶▶) for 3 seconds.
⑥ Adjust VR107 (KICK GAIN) so that the [TER] signal cycle is 1.5 ± 0.5 when [TRHD] signal level is High.
* Adjust at the inner circumference of the disc.
⑦ Press Reverse mode key (◀◀) for 3 seconds and confirm that [TER] signal cycle is within the above specification but in reverse phase.



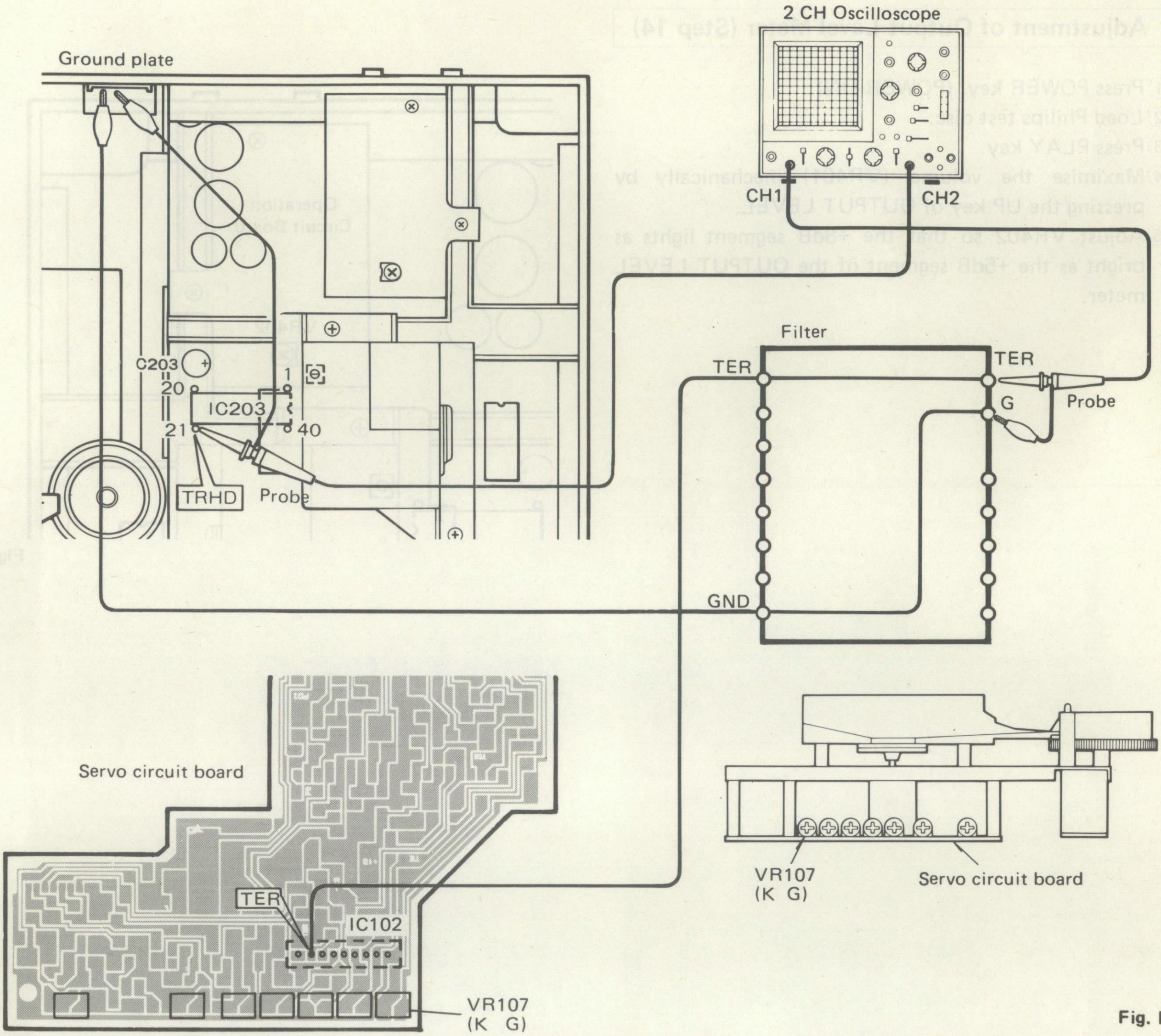
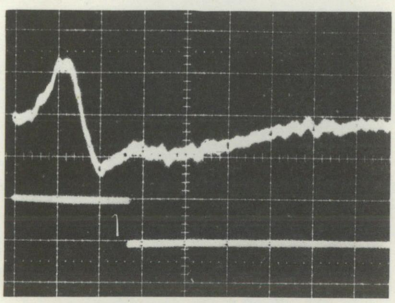


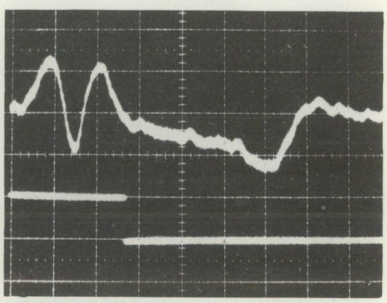
Fig. L

Incorrect



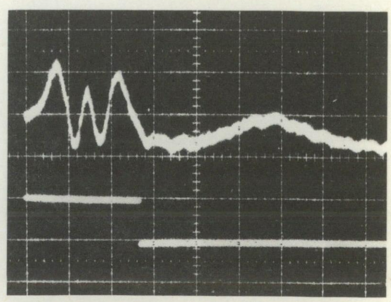
This shows about 0.9 cycle which is incorrect

Good



This shows about 1.7 cycle which is within specification.

Incorrect



This shows about 2.5 cycle which is incorrect

Confirmation of Search (◀◀ , ▶▶) Operation (Step 13)

① Load Philips test disc and press PLAY key.

② Press Fast Forward mode key (▶▶) and confirm that the displayed time (ELAPSED TIME) advances smoothly.

③ Press Reverse mode key (◀◀) and confirm as in step ②.

Adjustment of Output Level Meter (Step 14)

① Press POWER key. (POWER ON)
② Load Philips test disc.
③ Press PLAY key.
④ Maximise the volume (VR401) mechanically by pressing the UP key of OUTPUT LEVEL.
⑤ Adjust VR402 so that the +8dB segment lights as bright as the +5dB segment of the OUTPUT LEVEL meter.

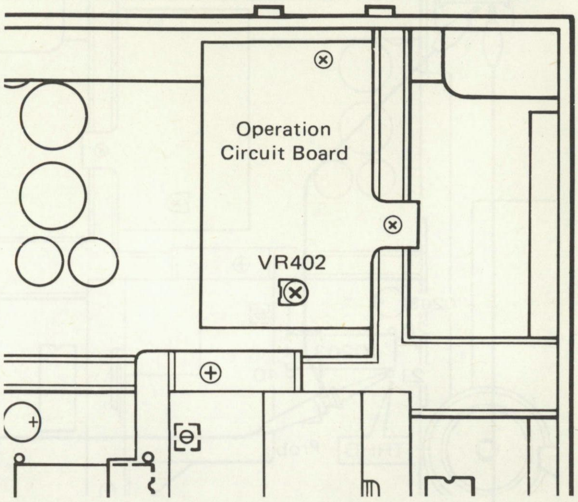
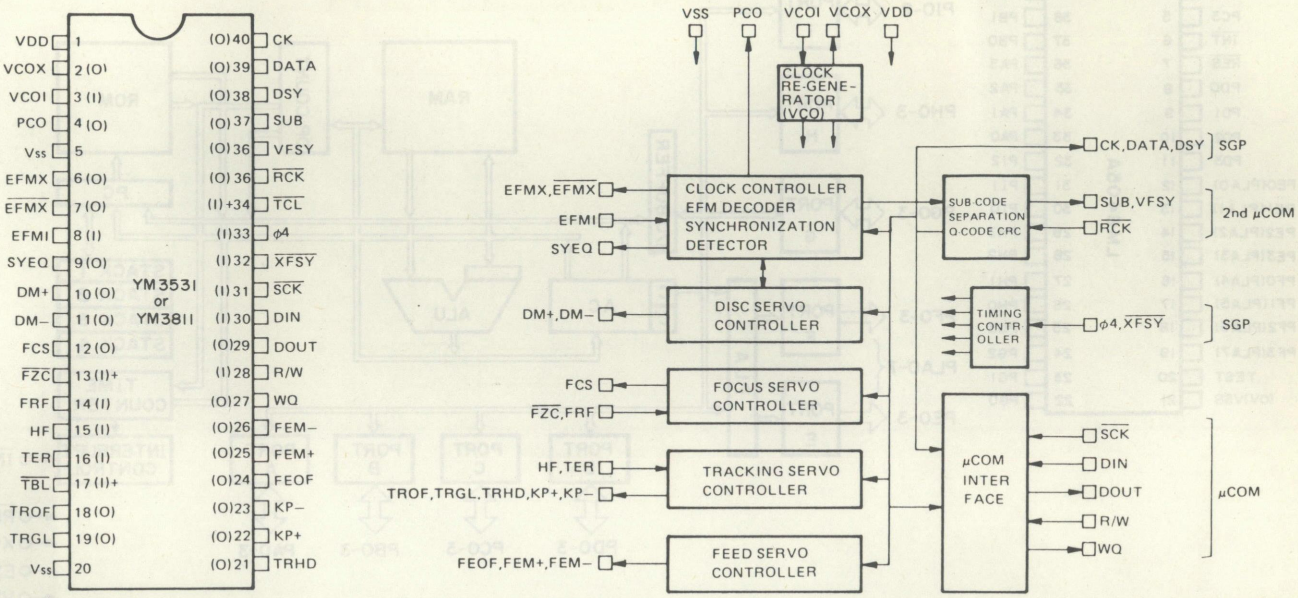


Fig. M

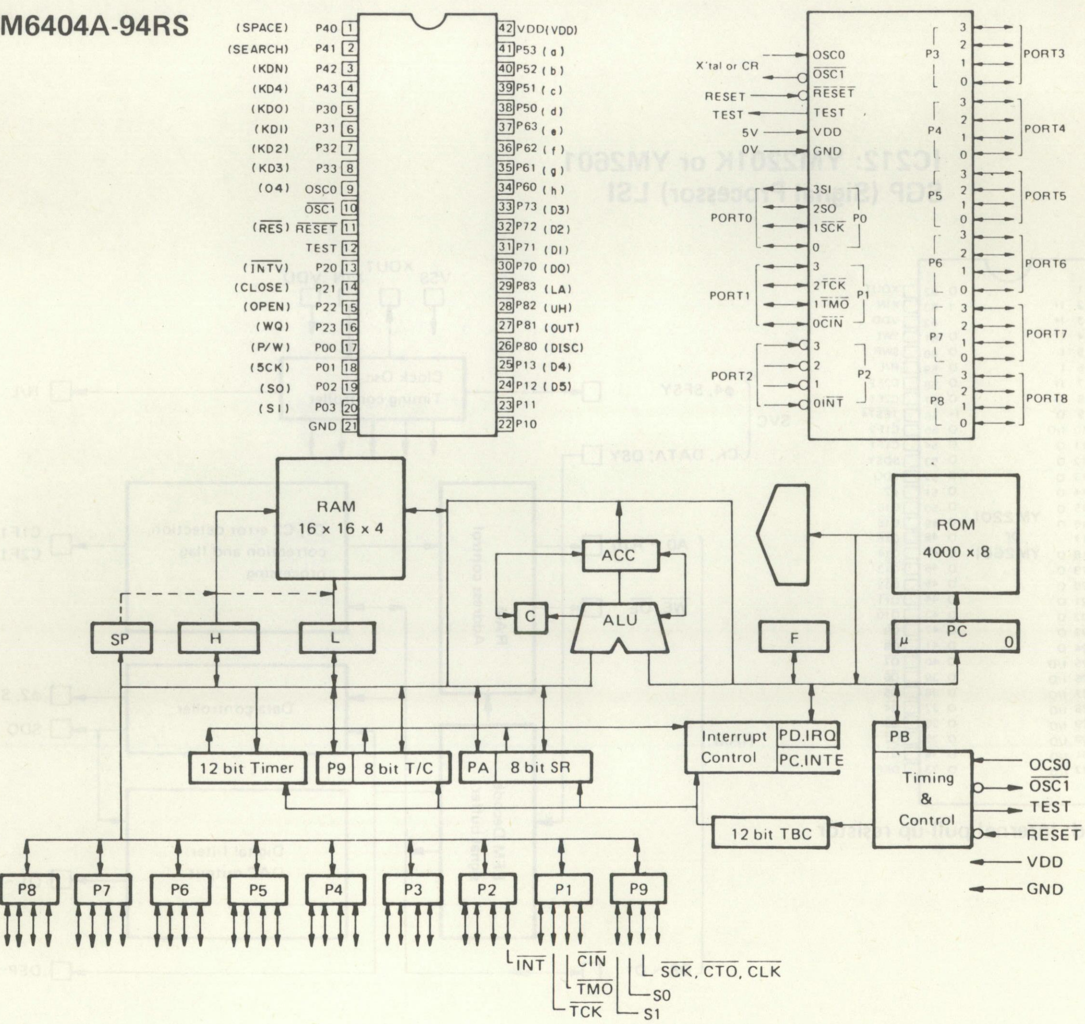
■ IC BLOCK

IC203: YM3531 or YM3811
SVC (Servo Controller) LSI

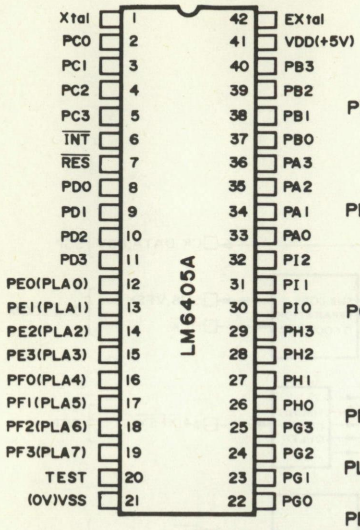


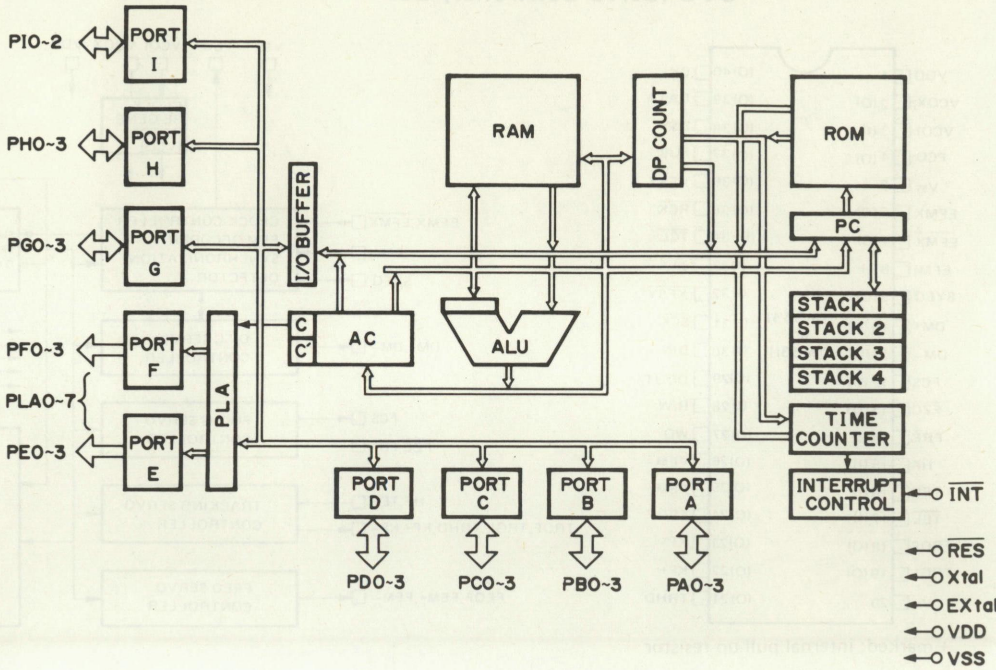
+ marked: internal pull up resistor

IC208: MSM6404A-94RS

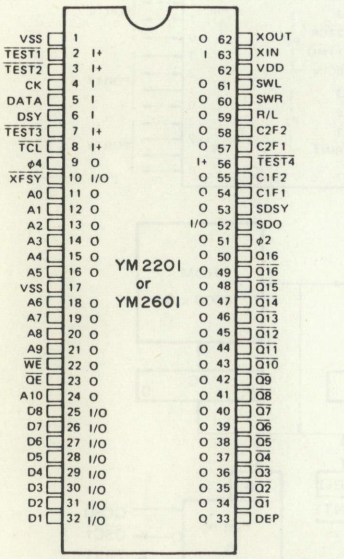


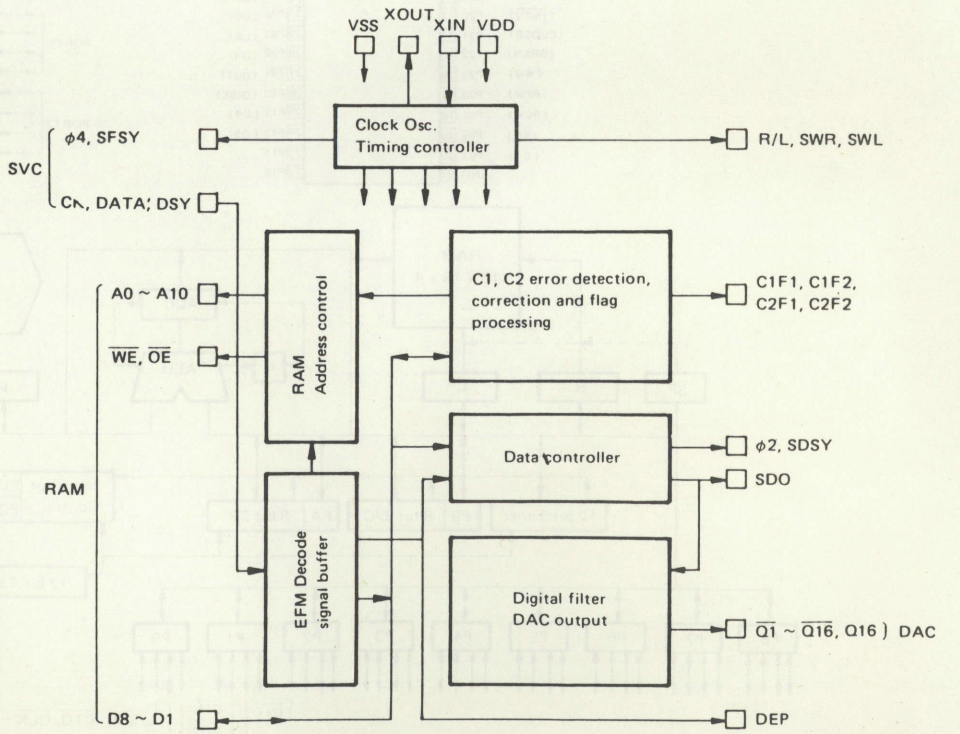
IC209: LM6405A-404





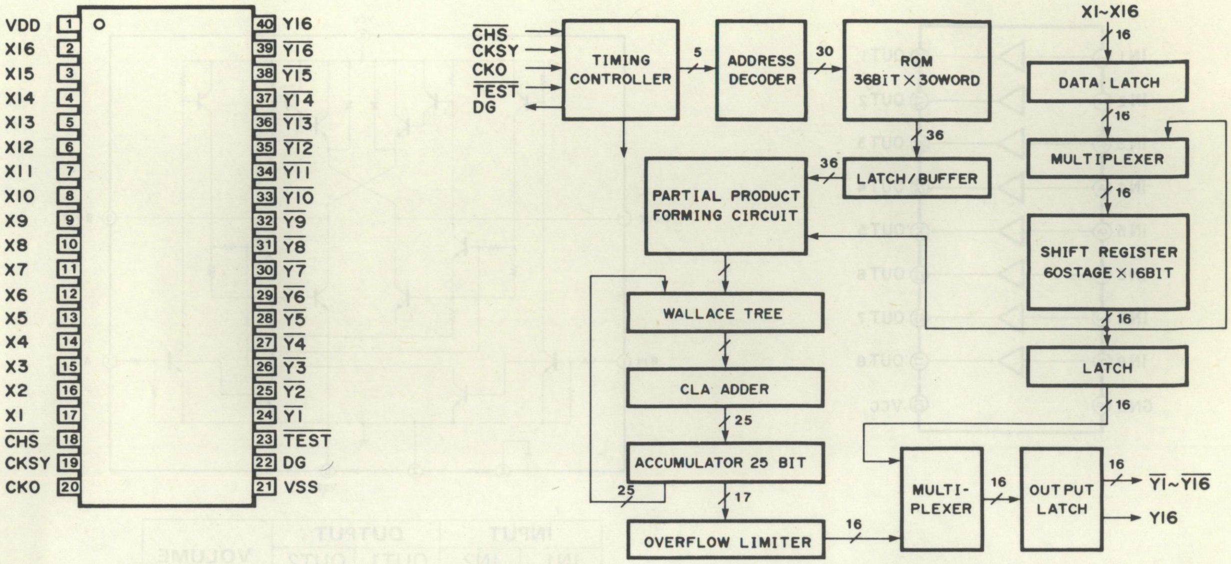
IC212: YM2201K or YM2601
SGP (Signal Processor) LSI



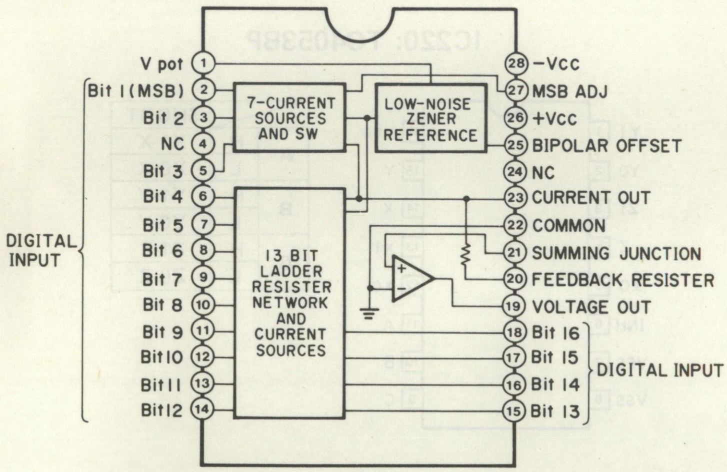


+ marked: internal pull-up resistor

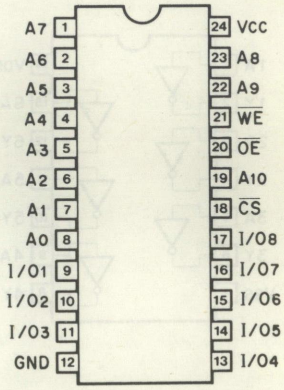
IC215, 216: SM5800



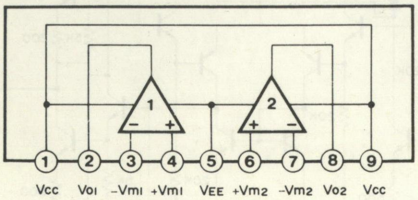
IC219: PCM54KP-V



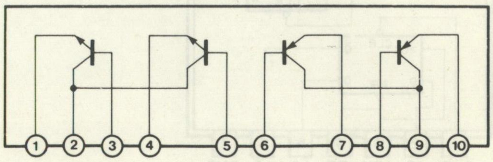
IC210: HM6116ASP-20



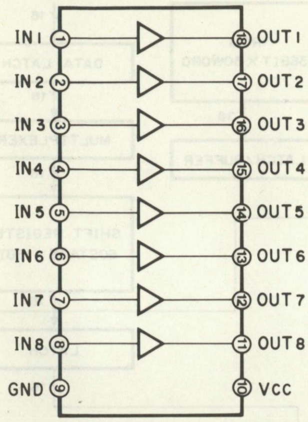
IC101, 103, 104, 202, 204: AN6551, NJM4558S or BA715
IC102, 205: NJM2043S
IC217, 218: NJM5532S
IC403: NJM4560S or BA4561S
IC404: NJM4556S
IC601, 602: NJM5532S . . . CD-2000M Only



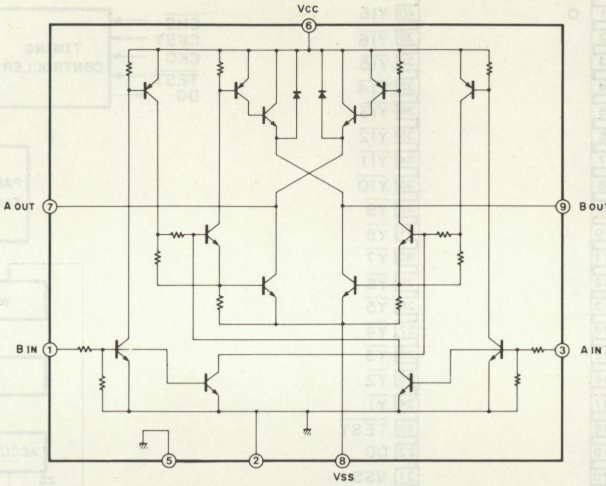
IC105, 201: STA451C



IC206, 207: LB1290

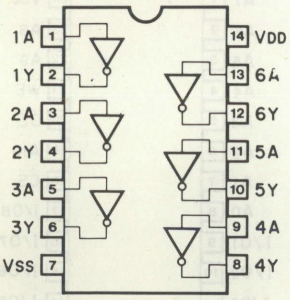


IC211, 405: BA6218

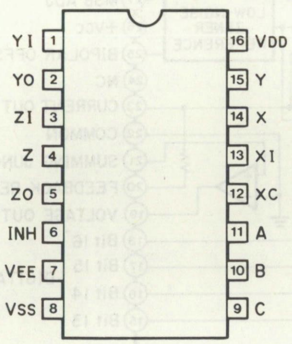


INPUT		OUTPUT		VOLUME
IN1 (3 pin)	IN2 (1 pin)	OUT1 (7 pin)	OUT2 (9 pin)	
L	L	OPEN	OPEN	STOP
H	L	H	L	UP
L	H	L	H	DOWN
H	H	L	L	BRAKE

IC213: TC40H004P

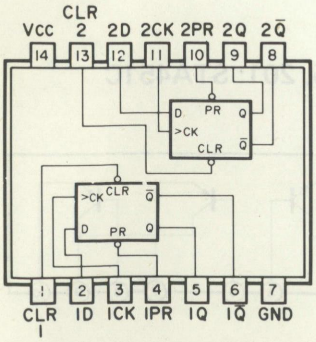


IC220: TC4053BP

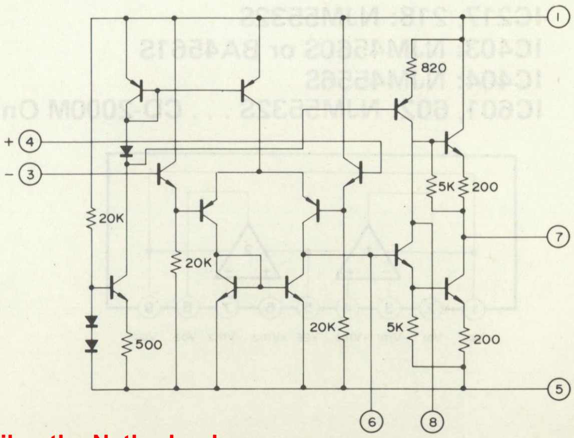


		SHORT
A	H	X1-X
	L	X0-X
B	H	Y1-Y
	L	Y0-Y
C	H	Z1-Z
	L	Z0-Z

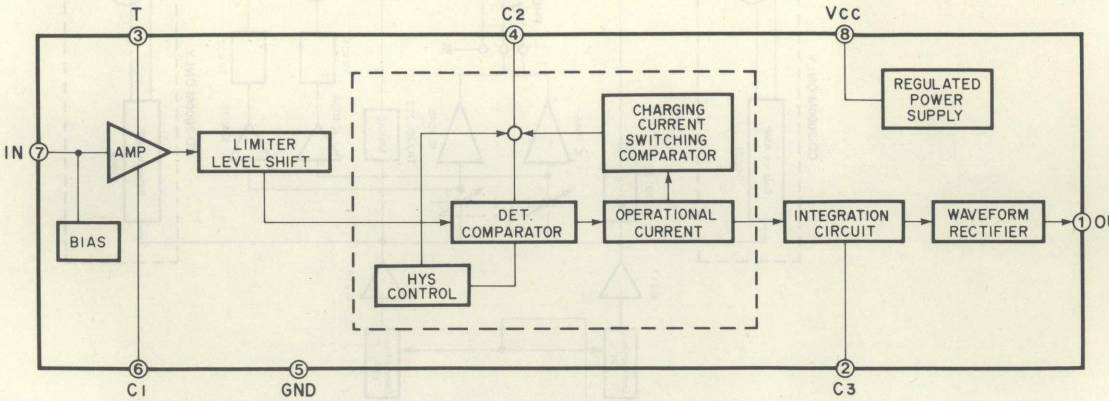
IC214: TC40H074P



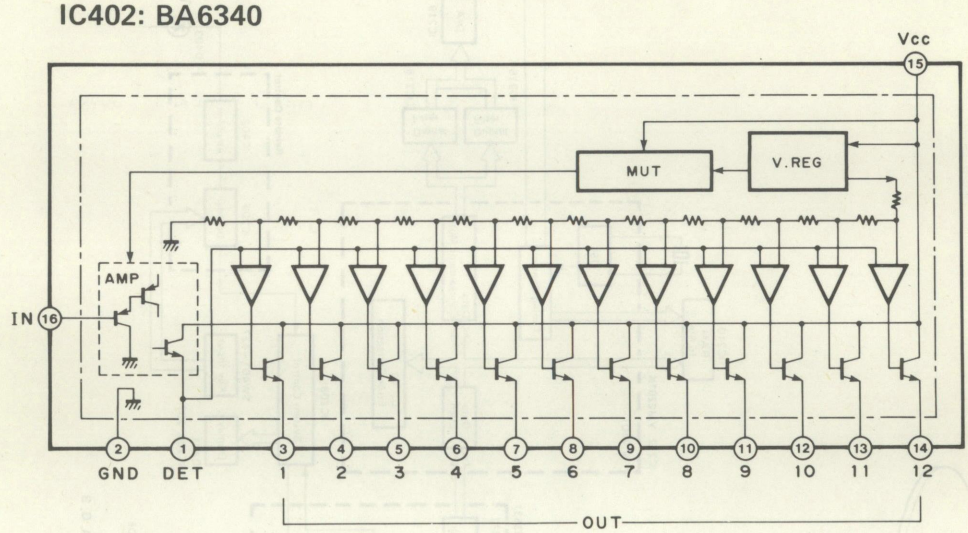
IC221, 222: LA3170



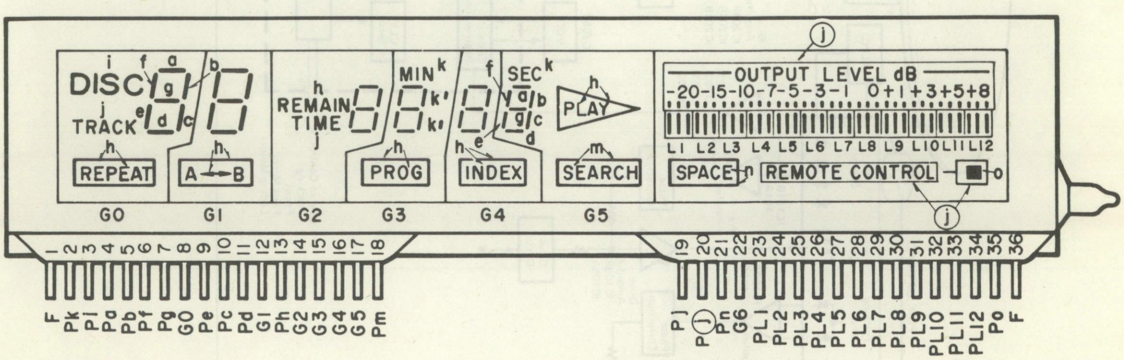
IC401: BA6146



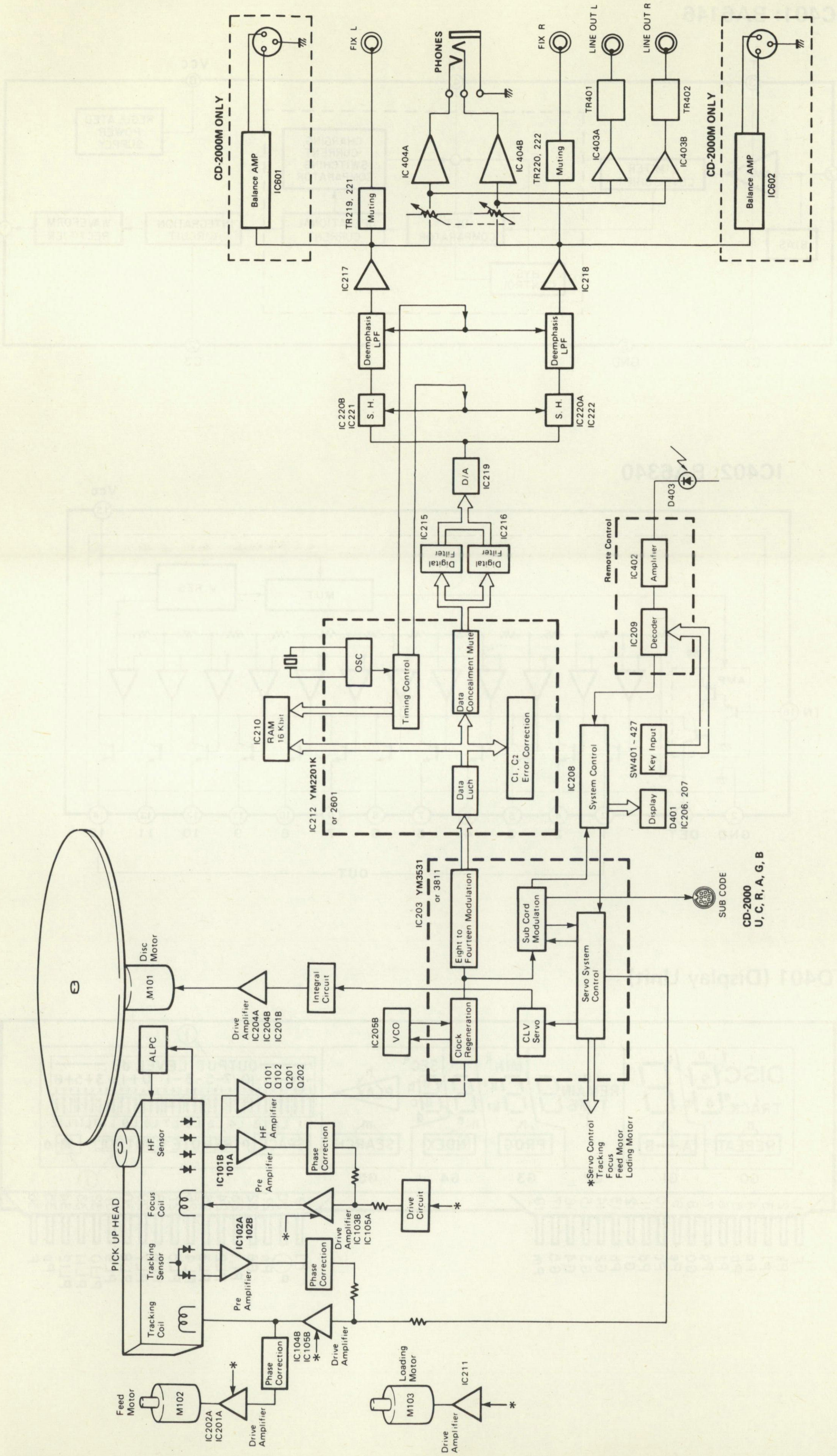
IC402: BA6340




D401 (Display Unit)



■BLOCK DIAGRAM



■ SCHEMATIC DIAGRAM (CD-2000)

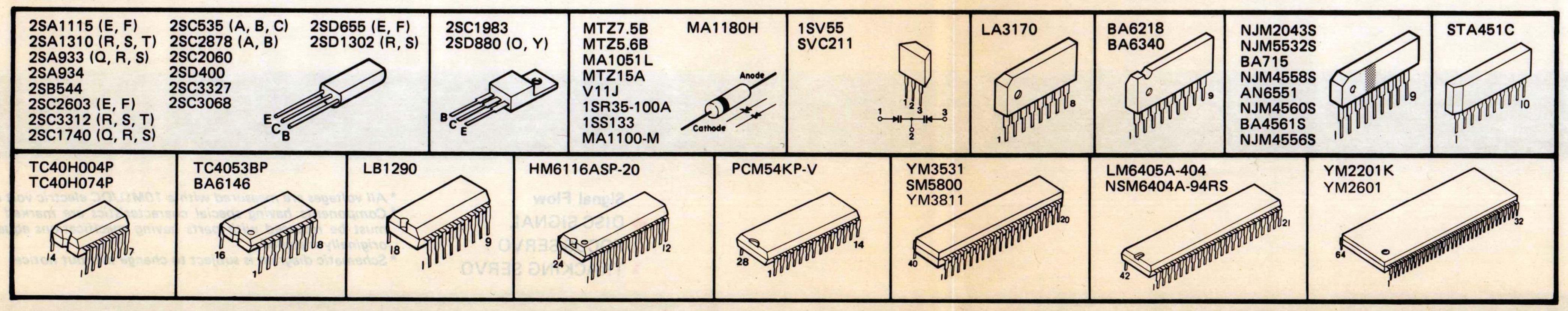


RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
⊘	CARBON FILM RESISTOR (1/6W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	SEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR

CAPACITOR


REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
NO MARK	CERAMIC CAPACITOR
◎	POLYESTEL FILM CAPACITOR(MYLAR)
○	POLYSTYRENE FILM CAPACITOR
⦶	MICA CAPACITOR
Ⓟ	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR



Signal Flow
- DISC SIGNAL
- FOCUS SERVO
- TRACKING SERVO

* *All voltages are measured with a 10MΩ/DC electric volt meter.*
* *Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.*
* *Schematic diagram is subject to change without notice.*

■ SCHEMATIC DIAGRAM (CD-2000M)



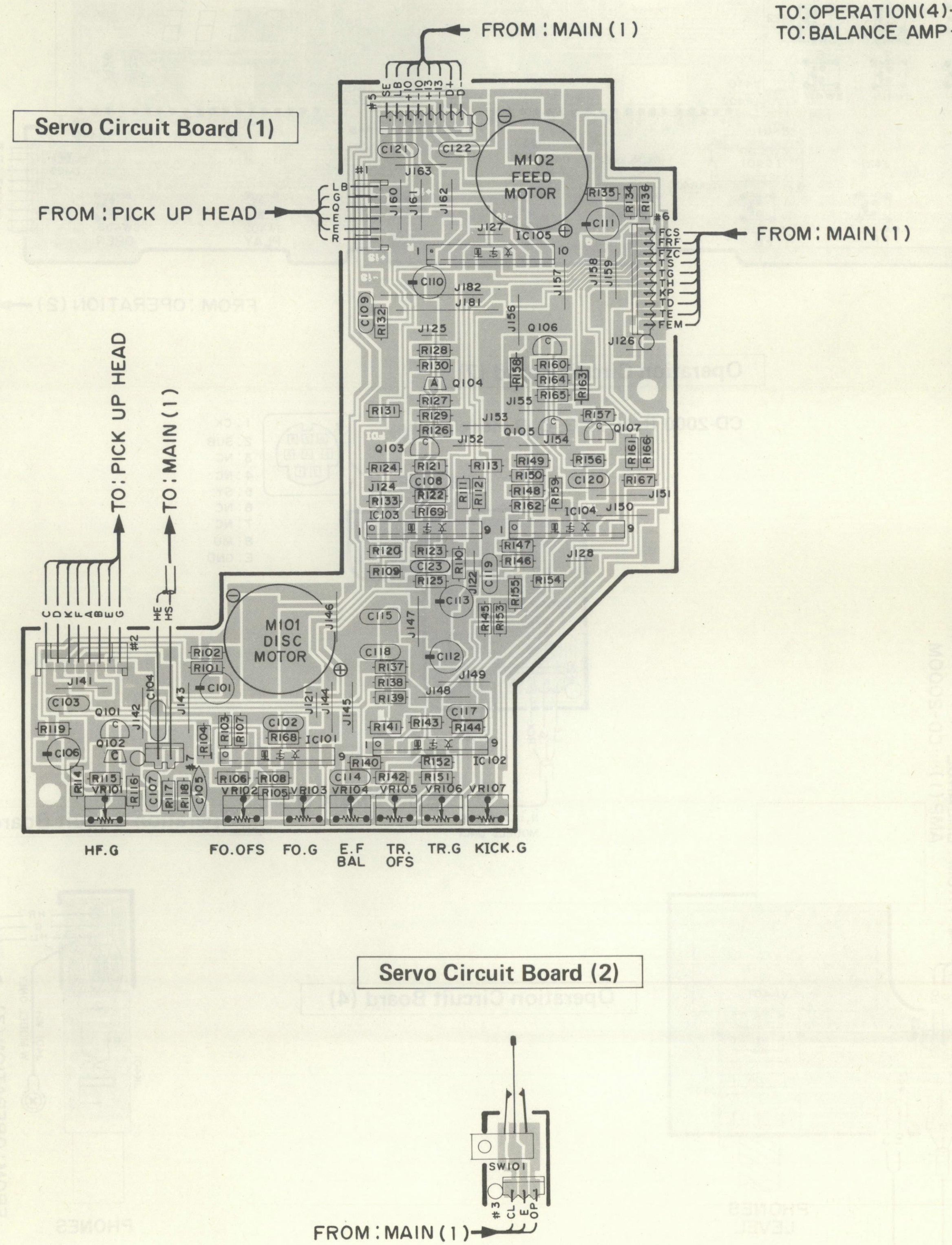
Signal Flow
- DISC SIGNAL
- FOCUS SERVO
- TRACKING SERVO

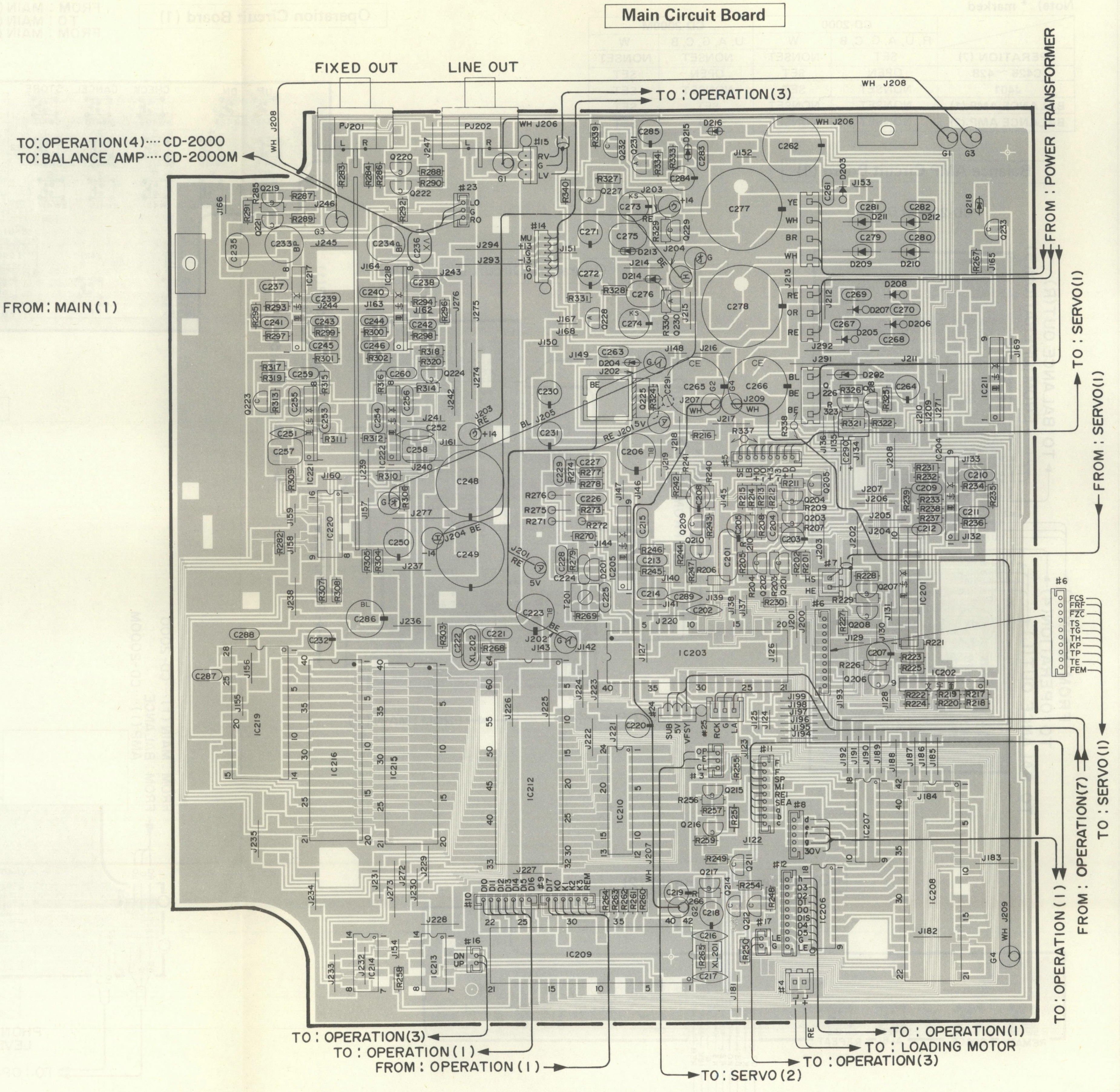
* All voltages are measured with a 10MΩ/DC electric volt meter.
* Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

■ PRINTED CIRCUIT BOARD (Pattern side)

Note) * marked

	CD-2000		CD-2000M	
	R, U, A, G, C, B	W	U, A, G, C, B	W
#24, 25	SET	NONSET	NONSET	NONSET
C291	OPEN	0.022	OPEN	0.022
J206 ~ 209	OPEN	SHORT	OPEN	SHORT





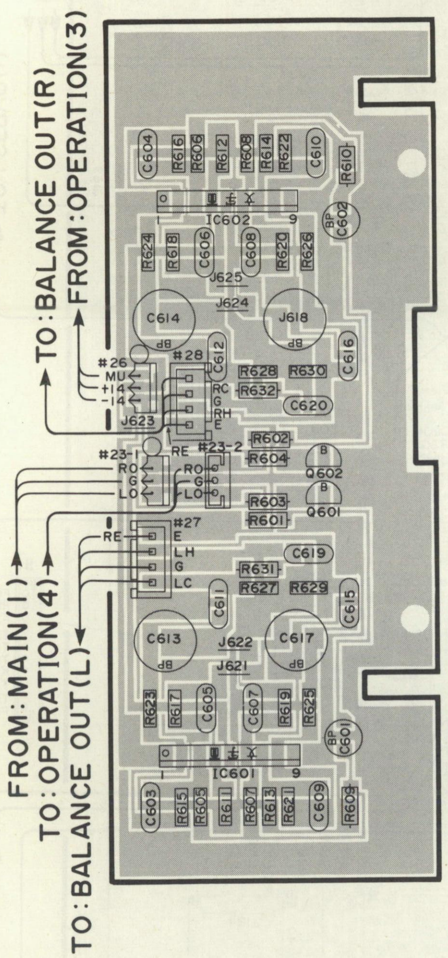
■PRINTED CIRCUIT BOARD(Pattern side)

Note) * marked

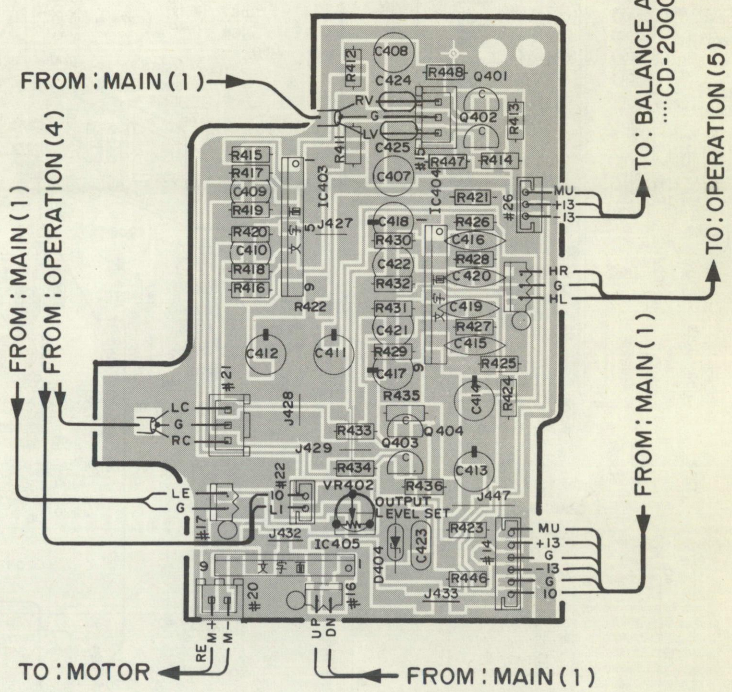
	CD-2000		CD-2000M	
	R, U, A, G, C, B	W	U, A, G, C, B	W
OPERATION (7)	SET	NONSET	NONSET	NONSET
C426 ~ 428	OPEN	SET	OPEN	SET
J401	NONSET	SET	NONSET	SET
BALANCE AMP (1)	NONSET	NONSET	SET	SET
BALANCE AMP (2)	NONSET	NONSET	SET	SET

Balance AMP Circuit Board (1)

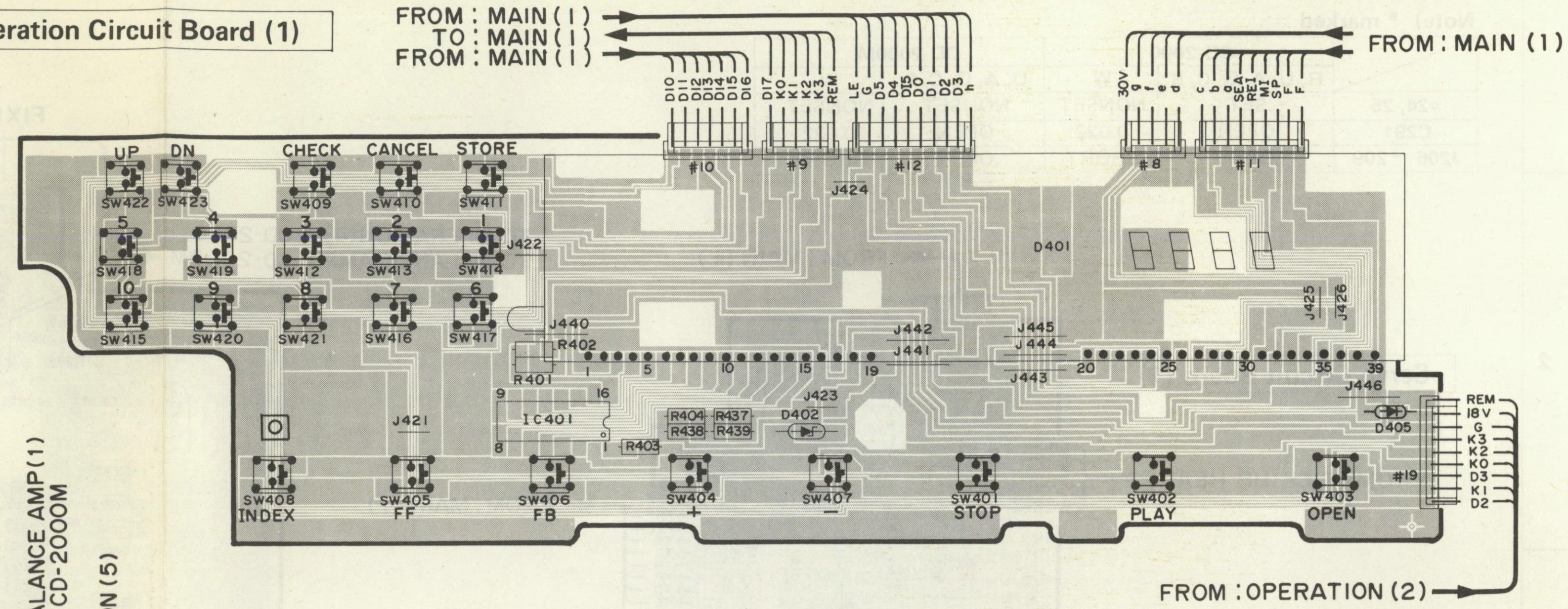
CD-2000M Only



Operation Circuit Board (3)

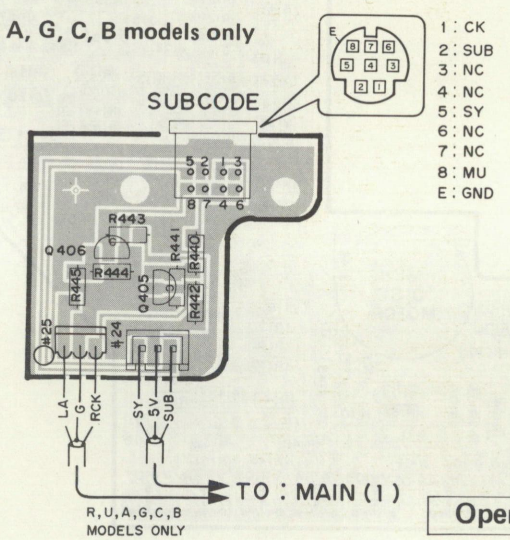


Operation Circuit Board (1)

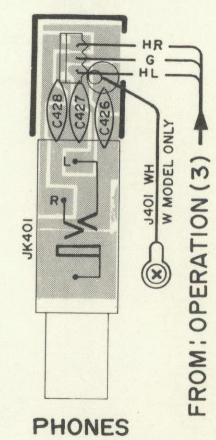


Operation Circuit Board (7)

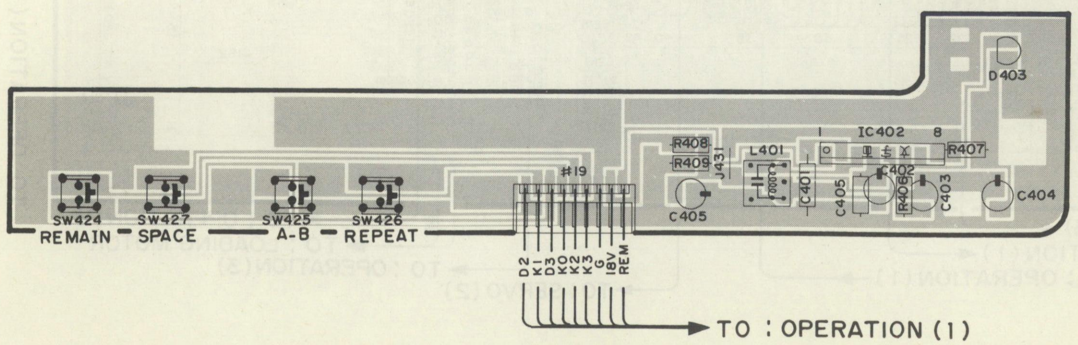
CD-2000 R, U, A, G, C, B models only



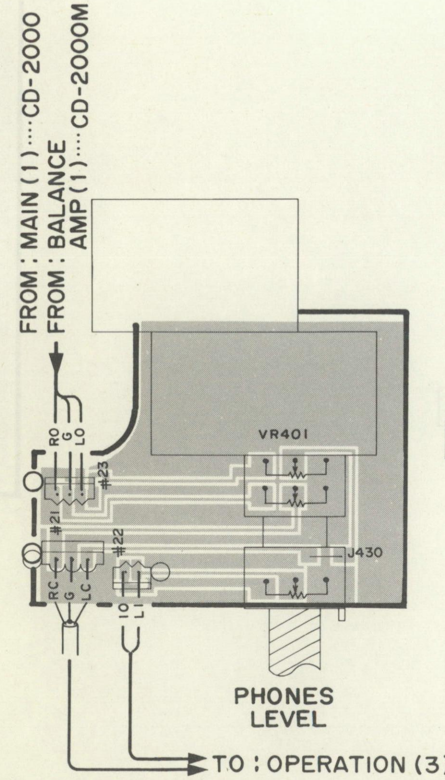
Operation Circuit Board (5)



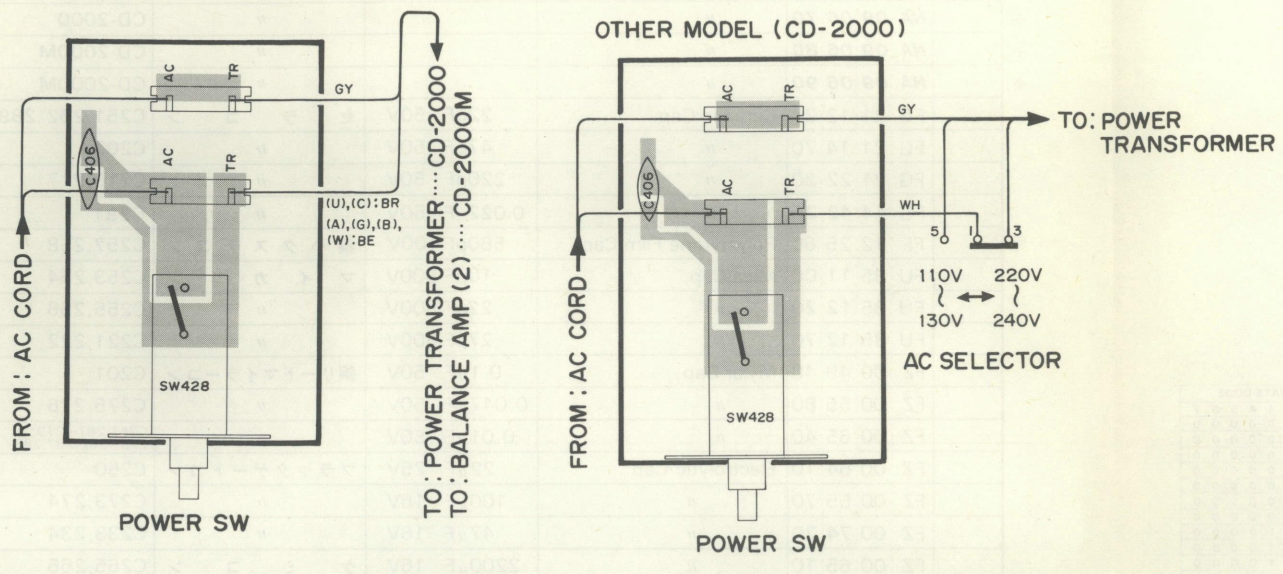
Operation Circuit Board (2)



Operation Circuit Board (4)

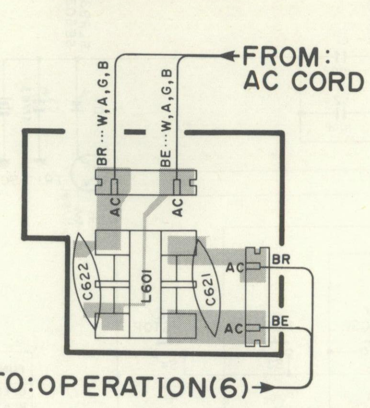


Operation Circuit Board (6)



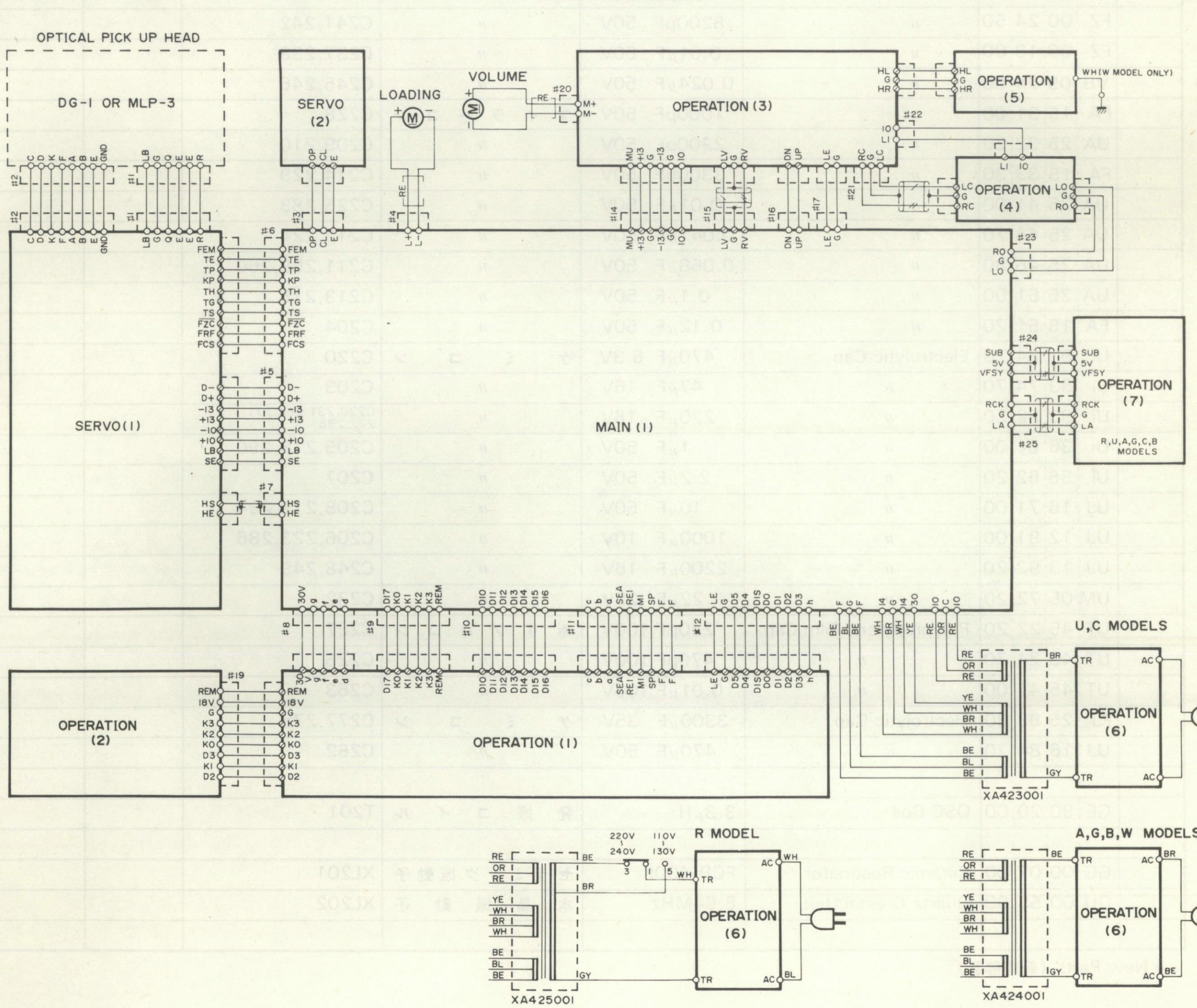
Balance AMP Circuit Board (2)

CD-2000M Only

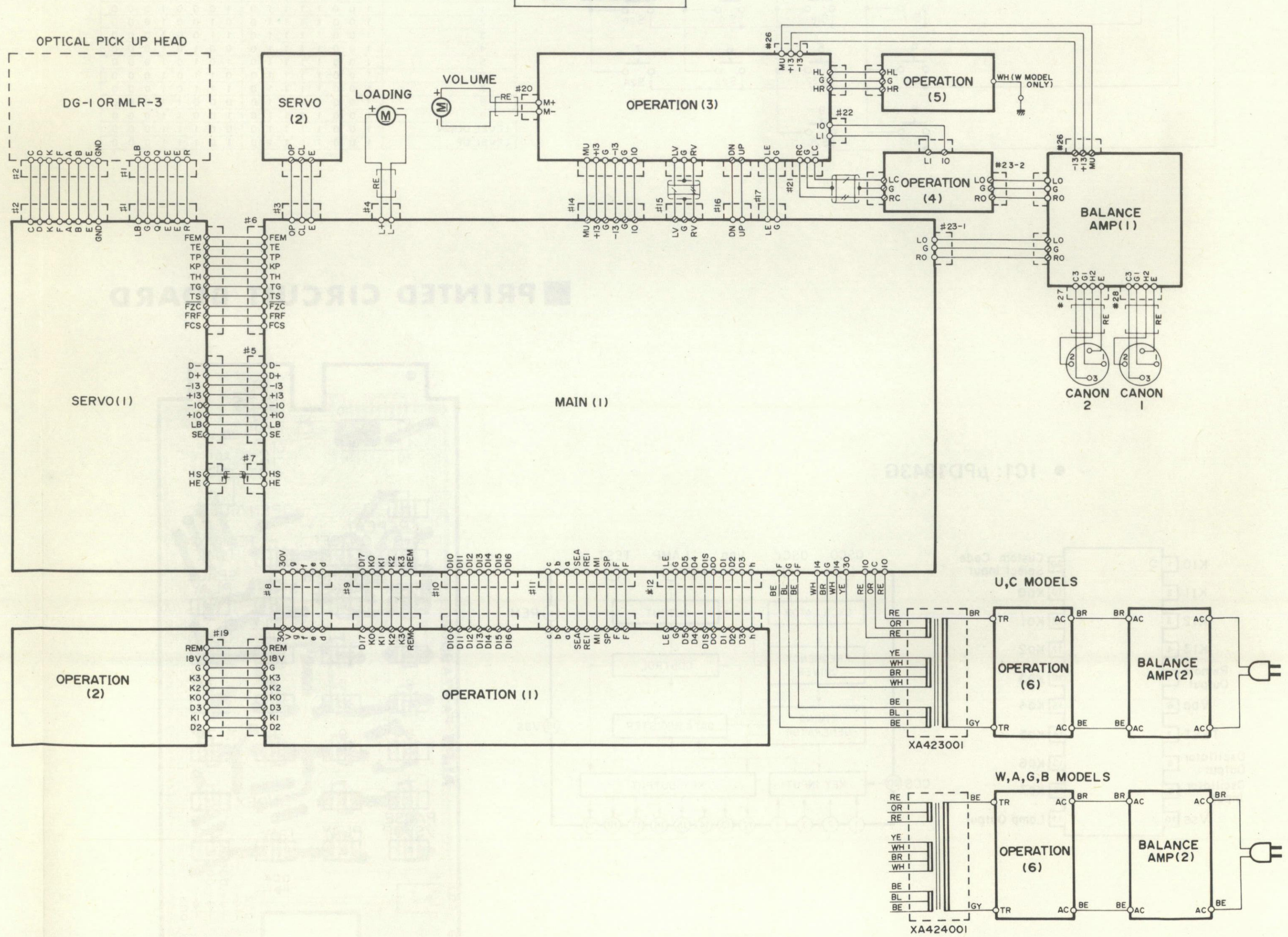


■ WIRING

CD-2000

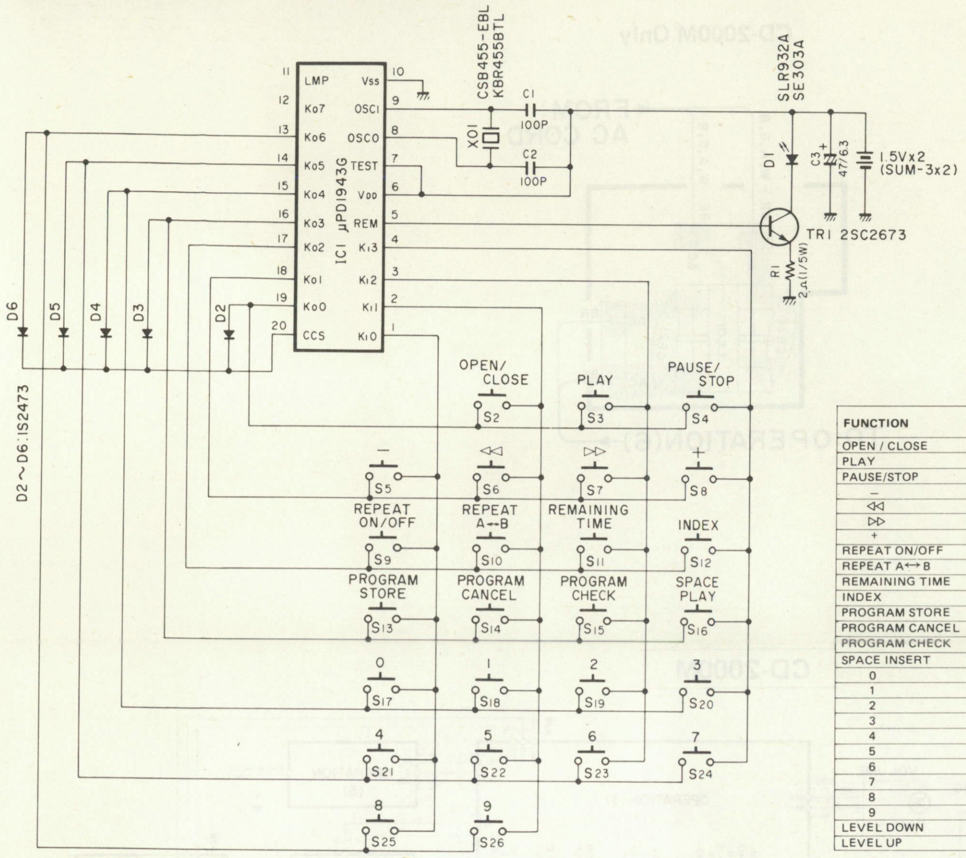


CD-2000M



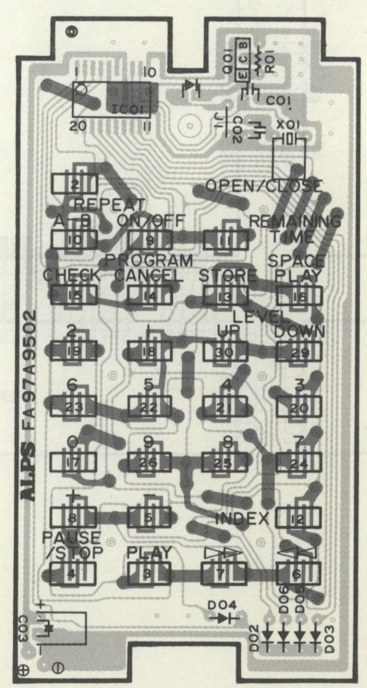
RS-D20 REMOTE CONTROL TRANSMITTER

SCHEMATIC DIAGRAM

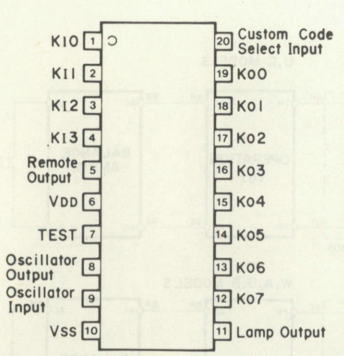


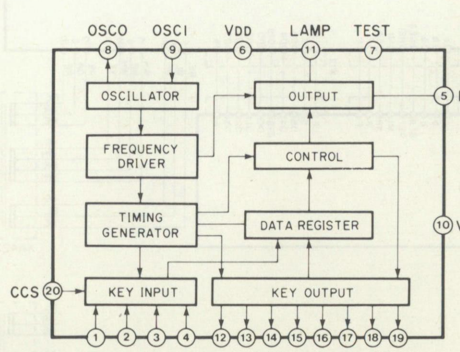
FUNCTION	CASTAM CODE								DATE CODE							
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
OPEN / CLOSE	1	0	0	1	1	1	1	0	1	0	0	0	0	0	0	0
PLAY	1	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0
PAUSE/STOP	1	0	0	1	1	1	1	0	1	1	0	0	0	0	0	0
–	1	0	0	1	1	1	1	0	0	0	1	0	0	0	0	0
◁◁	1	0	0	1	1	1	1	0	1	0	1	0	0	0	0	0
▷▷	1	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0
+	1	0	0	1	1	1	1	0	1	1	1	0	0	0	0	0
REPEAT ON/OFF	1	0	0	1	1	1	1	0	0	0	0	1	0	0	0	0
REPEAT A↔B	1	0	0	1	1	1	1	0	1	0	0	1	0	0	0	0
REMAINING TIME	1	0	0	1	1	1	1	0	0	1	0	1	0	0	0	0
INDEX	1	0	0	1	1	1	1	0	1	1	0	1	0	0	0	0
PROGRAM STORE	1	0	0	1	1	1	1	0	0	0	1	1	0	0	0	0
PROGRAM CANCEL	1	0	0	1	1	1	1	0	1	0	1	1	0	0	0	0
PROGRAM CHECK	1	0	0	1	1	1	1	0	0	1	1	1	0	0	0	0
SPACE INSERT	1	0	0	1	1	1	1	0	1	1	1	1	0	0	0	0
0	1	0	0	1	1	1	1	0	0	0	0	0	1	0	0	0
1	1	0	0	1	1	1	1	0	1	0	0	0	1	0	0	0
2	1	0	0	1	1	1	1	0	0	1	0	0	1	0	0	0
3	1	0	0	1	1	1	1	0	1	1	0	0	1	0	0	0
4	1	0	0	1	1	1	1	0	0	0	1	0	1	0	0	0
5	1	0	0	1	1	1	1	0	1	0	1	0	1	0	0	0
6	1	0	0	1	1	1	1	0	0	1	1	0	1	0	0	0
7	1	0	0	1	1	1	1	0	1	1	1	0	1	0	0	0
8	1	0	0	1	1	1	1	0	0	0	0	1	1	0	0	0
9	1	0	0	1	1	1	1	0	1	0	0	1	1	0	0	0
LEVEL DOWN	1	0	0	1	1	1	1	0	0	0	1	1	1	0	0	0
LEVEL UP	1	0	0	1	1	1	1	0	1	0	1	1	1	0	0	0

PRINTED CIRCUIT BOARD



• IC1: μPD1943G





PARTS LIST

■WARNING
Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

• Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS list. For the parts No. of the carbon resistor, refer to p. 51.

ELECTRICAL PARTS

Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
※	NA 08 90 00	*Main Circuit Board*		メインシート	CD-2000		R,U,A,G,C,B	
※	NA 09 06 70	〃		〃	CD-2000		W	
※	NA 09 06 80	〃		〃	CD-2000M		U,A,G,C,B	
※	NA 09 06 90	〃		〃	CD-2000M		W	
	FG 21 12 20	Ceramic Cap.	22pF 50V	セラコン	C251,252,289			
	FG 21 14 70	〃	47pF 50V	〃	C202			
	FG 21 22 20	〃	220pF 50V	〃	C216,217			
	FG 44 42 20	〃	0.022μF 50V	〃	C291		W	
※	FF 12 25 60	Polystyrene Film Cap.	560pF 100V	銅ハクスチコン	C257,258			
	FU 35 11 00	Mica Cap.	10pF 500V	マイカコン	C253,254			
	FU 35 12 20	〃	22pF 500V	〃	C255,256			
	FU 35 12 70	〃	27pF 500V	〃	C221,222			
	FZ 00 49 40	Mylar Cap.	0.1μF 50V	銅リードマイラーコン	C201			
	FZ 00 55 80	〃	0.047μF 50V	〃	C275,276			
	FZ 00 65 40	〃	0.01μF 50V	〃	C261,267~270, 279~282,287,288			
	FZ 00 64 10	Electrolytic Cap.	22μF 25V	ブラックゲートコン	C250			
	FZ 00 55 70	〃	100μF 16V	〃	C273,274			
	FZ 00 74 20	〃	47μF 16V	〃	C233,234			
	FZ 00 65 10	〃	2200μF 16V	ケミコン	C265,266			
	FZ 00 34 10	Mylar Cap.	1μF 125V	マイラーコン	C235,236			
	VB 05 70 00	〃	1600pF 50V	銅リードマイラーコン	C243,244			
※	VB 05 71 00	〃	2400pF 50V	〃	C239,240			
	FZ 00 24 50	〃	8200pF 50V	〃	C241,242			
	FZ 00 13 00	〃	0.01μF 50V	〃	C237,238			
※	VB 05 74 00	〃	0.024μF 50V	〃	C245,246			
	FA 15 31 00	〃	1000pF 50V	マイラーコン	C228			
	UA 25 32 20	〃	2200pF 50V	〃	C209,210			
	FA 15 33 30	〃	3300pF 50V	〃	C214,229			
	UA 25 41 00	〃	0.01μF 50V	〃	C225,283			
	UA 25 44 70	〃	0.047μF 50V	〃	C212,224			
	UA 25 46 80	〃	0.068μF 50V	〃	C211,259,260			
	UA 25 51 00	〃	0.1μF 50V	〃	C213,215			
	FA 15 51 20	〃	0.12μF 50V	〃	C204			
	Ui 91 84 70	Electrolytic Cap.	470μF 6.3V	ケミコン	C220			
	Ui 33 74 70	〃	47μF 16V	〃	C203			
	Ui 93 82 20	〃	220μF 16V	〃	C230,231,264,271, 272,285			
	Ui 36 61 00	〃	1μF 50V	〃	C205,218,290			
	Ui 36 62 20	〃	2.2μF 50V	〃	C207			
	UJ 16 71 00	〃	10μF 50V	〃	C208,219,284			
※	UJ 12 91 00	〃	1000μF 10V	〃	C206,223,286			
※	UJ 13 92 20	〃	2200μF 16V	〃	C248,249			
	UM 05 72 20	〃	22μF 25V	〃	C232			
	UT 45 22 20	Polypropylene Film Cap.	220pF 100V	ポリプロコン	C227			
	UT 45 24 70	〃	470pF 100V	〃	C226			
	UT 45 41 00	〃	0.01μF 100V	〃	C263			
	FJ 25 93 30	Electrolytic Cap.	3300μF 35V	ケミコン	C277,278			
	UJ 16 84 70	〃	470μF 50V	〃	C262			
	GE 90 20 00	OSC Coil	3.3μH	発振コイル	T201			
	GG 00 07 00	Ceramic Resonator	FCR-400K	セラミック振動子	XL201			
	QU 00 58 00	Quartz Crystal Unit	8.64MHz	水晶振動子	XL202			

※New Parts（新規部品）

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク	
		HU 75 72 20	Metal Film Resistor	22kΩ 1/4W	金属皮膜抵抗	R271,272,275,276				
		HV 35 36 80	Flame Proof Carbon Resistor	6.8Ω 1/4W	不燃化カーボン抵抗	R337,338				⚠
		iA 11 15 10	Transistor	2SA1115 (E,F)	トランジスタ	Q210,216,218,231 Inter-changeable				
		iX 60 31 70	〃	2SA1310(R,S,T)	〃	〃				
		iA 09 33 00	〃	2SA933(Q,R,S)	〃	〃				
		iA 09 34 00	〃	2SA934	〃	Q226,228,230 Inter-changeable				⚠
		iB 05 44 10	〃	2SB544	〃	〃				⚠
		iC 26 03 10	〃	2SC2603 (E,F)	〃	Q202~209,211,212,214, 215,217,232 Inter-changeable				
		iX 60 31 80	〃	2SC3312(R,S,T)	〃	〃				
		iC 17 40 00	〃	2SC1740(Q,R,S)	〃	〃				
		iX 60 42 00	〃	2SC2878 (A,B)	〃	Q219~224 Inter-changeable				
		iC 33 27 00	〃	2SC3327	〃	〃				
		iC 20 60 00	〃	2SC2060	〃	Q227,229,233 Inter-changeable				⚠
		iD 04 00 00	〃	2SD400	〃	〃				⚠
		iC 19 83 00	〃	2SC1983	〃	Q225 Inter-changeable				⚠
		iD 08 80 00	〃	2SD880 (O,Y)	〃	〃		R,U,A,G,C,B		⚠
		iC 05 35 00	〃	2SC535(A,B,C)	〃	Q201				
		iF 00 49 10	Varactor Diode	ISV55	FMバラクターダイオード	D201 Inter-changeable				
		iF 00 49 20	〃	SVC211	〃	〃				
		iF 00 64 70	Zener Diode	MTZ7.5B	ツェナーダイオード	D218				
		iX 60 23 50	〃	MTZ5.6B	〃	D204				
		iX 60 19 80	〃	MA1051L	〃	D202				
		iX 60 23 70	〃	MTZ15A	〃	D213,214				
		iF 00 96 20	Diode	V11J	ダイオード	D209~212				
		iF 00 84 80	〃	ISR35-100AT-93X	〃	D203,205~208				
		iF 00 34 50	〃	ISS133	〃	D215,216				
		iG 05 51 00	IC	TC4053BP	IC	IC220				
		iG 03 47 00	〃	AN6551	〃	IC202,204 Inter-changeable				
		iG 07 68 00	〃	NJM4558S	〃	〃				
		iG 13 22 00	〃	BA715	〃	〃				
		iG 03 54 10	〃	LA3170	〃	IC221,222				
		iG 05 10 00	〃	TC40H004P	〃	IC213				
		iG 05 11 00	〃	TC40H074P	〃	IC214				
		iG 08 02 00	〃	NJM2043S	〃	IC205				
		iG 11 94 00	〃	STA451C	〃	IC201				
		iG 12 13 00	〃	HM6116ASP-20	〃	IC210				
		iG 13 42 00	〃	LM6405A-404	〃	IC209				
		iG 15 35 00	〃	BA6218	〃	IC211				
		iT 22 01 20	〃	YM2201K	〃	IC212				
		iT 35 31 00	〃	YM3531	〃	IC203				
※		XA 27 90 01	〃	SM5800	〃	IC215,216				
※		XA 42 60 01	〃	NJM5532S	〃	IC217,218				
※		XA 42 70 01	〃	LB1290	〃	IC206,207				
※		XA 42 90 01	〃	MSM6404A-94RS	〃	IC208				
※		XA 39 40 02	〃	PCM54KP-V	〃	IC219				
		LB 20 19 50	Pin Jack	2P	ピンジャック	PJ201,202				

※New Parts（新規部品）

Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
	LA 00 21 20	Lapping Terminal	P=5,3P,i-Type	i型ラッピング端子板				
	LA 00 20 30	〃	P=5,4P,i-Type	〃				
	LB 91 80 20	Base Pin	2P i-Type	XHベースピン				
	LB 91 80 30	〃	3P i-Type	〃	CD-2000		R,U,A,G,C,B	
	BB 06 83 70	Metal,Earth		アース金具				
	BB 07 04 20	Bus Bar	l=100	バスバー				
	BA 08 40 00	Heat Sink		放熱器				
	Ei 33 00 86	Binding Head Tapping Screw	3×8 FCRM3-BI	バインドタッピングネジ	PACK			
※	AA 62 92 00	Support		サポートスタビライザー				
	CB 06 88 80	Plastic Rivet		プラスチックリベット				
※	VB 41 63 00	Ferrite Core	FSOH041RN	フェライトコア			W	
	NA 08 92 30	***Servo Circuit Board***		サーボシート		CD-500		
	FC 34 44 70	Mylar Cap.	0.047μF 50V	マイラーコン	C121,122			
	FG 21 26 80	Ceramic Cap.	680pF 50V	セラコン	C105			
	UA 25 31 80	Mylar Cap.	1800pF 50V	マイラーコン	C114,115			
	FA 15 36 80	〃	6800pF 50V	〃	C102			
	UA 25 44 70	〃	0.047μF 50V	〃	C107,108			
	UA 25 51 00	〃	0.1μF 50V	〃	C103,104,118,123			
	FA 15 51 20	〃	0.12μF 50V	〃	C117			
	FA 15 51 80	〃	0.18μF 50V	〃	C109,120			
	UA 55 54 70	〃	0.47μF 50V	〃	C119			
	Ui 22 81 00	Electrolytic Cap.	100μF 10V	ケミコン	C101,110,111			
	Ui 33 74 70	〃	47μF 16V	〃	C112,113			
	UJ 14 64 70	〃	4.7μF 25V	〃	C106			
	VA 78 63 00	Pre-Set Potentiometer	B10kΩ	半固定抵抗	VR101,105			
	VA 78 66 00	〃	B47kΩ	〃	VR104,106			
	VA 78 67 00	〃	B100kΩ	〃	VR102,103			
	VA 78 70 00	〃	B470kΩ	〃	VR107			
	iA 11 15 10	Transistor	2SA1115(E,F)	トランジスタ	Q104 (Inter-changeable)			
	iX 60 31 70	〃	2SA1310(R,S,T)	〃	〃 (Inter-changeable)			
	iA 09 33 00	〃	2SA933(Q,R,S)	〃	〃 (Inter-changeable)			
	iC 05 35 00	〃	2SC535(A,B,C)	〃	Q101			
	iC 26 03 10	〃	2SC2603(E,F)	〃	Q102 (Inter-changeable)			
	iX 60 31 80	〃	2SC3312(R,S,T)	〃	〃 (Inter-changeable)			
	iC 17 40 00	〃	2SC1740(Q,R,S)	〃	〃 (Inter-changeable)			
	iX 60 42 00	〃	2SC2878(A,B)	〃	Q103,105~107 (Inter-changeable)			
	iC 30 68 00	〃	2SC3068	〃	〃 (Inter-changeable)			
	iC 33 27 00	〃	2SC3327	〃	〃 (Inter-changeable)			
	iD 06 55 10	〃	2SD655 (E,F)	〃	〃 (Inter-changeable)			
	iD 13 02 00	〃	2SD1302(R,S)	〃	〃 (Inter-changeable)			
	iG 03 47 00	IC	AN6551	IC	IC101,103,104 (Inter-changeable)			
	iG 07 68 00	〃	NJM4558S	〃	〃 (Inter-changeable)			
	iG 13 22 00	〃	BA715	〃	〃 (Inter-changeable)			
	iG 08 02 00	〃	NJM2043S	〃	IC102			
	iG 11 94 00	〃	STA451C	〃	IC105			
	KA 90 63 70	Switch	MSW-1485	タクトスイッチ	SW101			

※New Parts（新規部品）

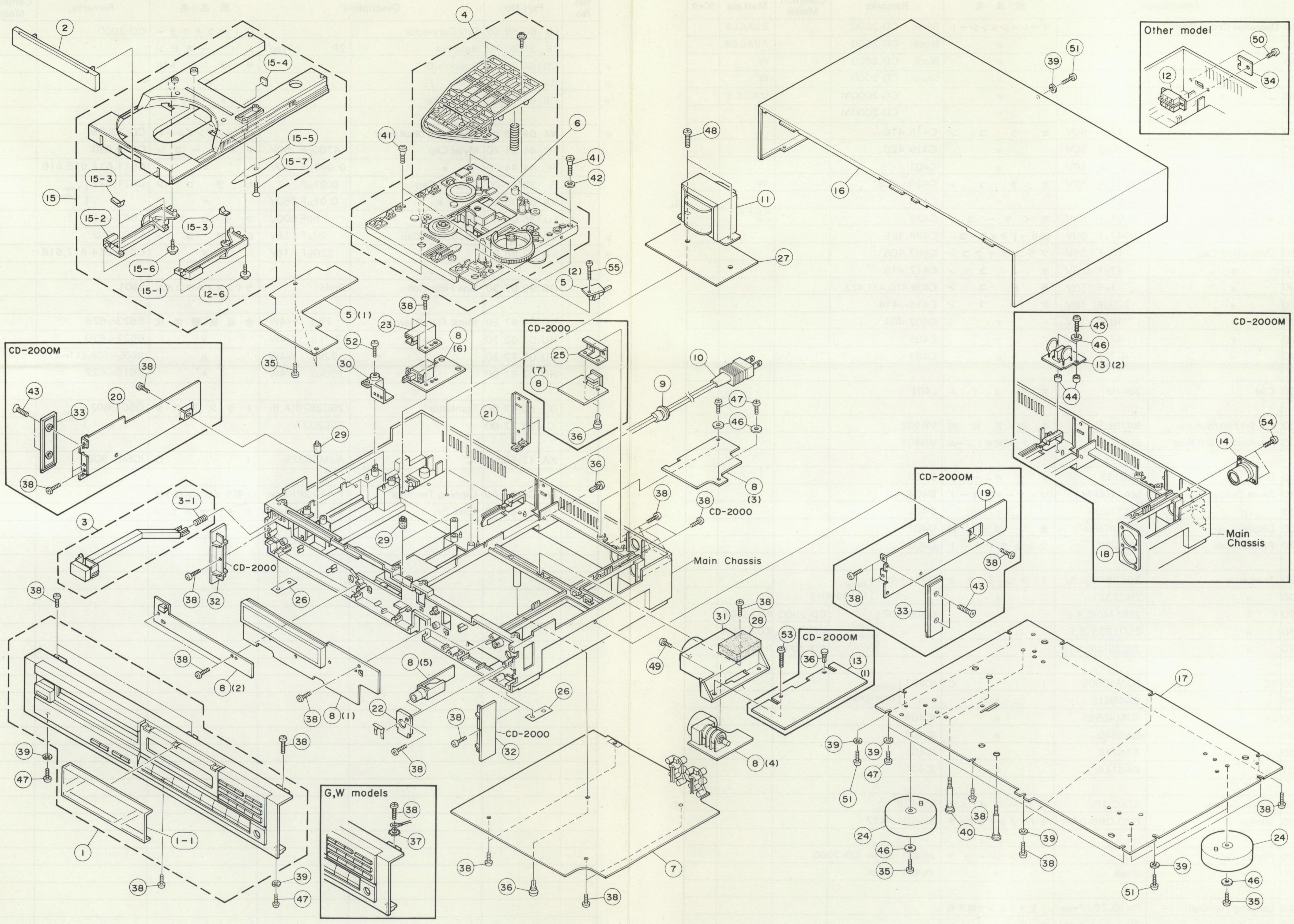
Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
※	***NA 08 90 30***	***Operation Circuit Board***		オペレーションシート	Silver CD-2000		R,U,A,G,C,B	
※	***NA 08 90 40***	〃		〃	Black CD-2000		R,U,A,G,C,B	
※	***NA 09 07 60***	〃		〃	Black CD-2000		W	
※	***NA 09 07 70***	〃		〃	Silver CD-2000		W	
※	***NA 09 07 80***	〃		〃	CD-2000M		U,A,G,C,B	
※	***NA 09 07 90***	〃		〃	CD-2000M		W	
	FG 21 14 70	Ceramic Cap.	47pF 50V	セラコン	C415,416			
	FG 21 22 20	〃	220pF 50V	〃	C419,420			
	FX 60 07 90	〃	0.01μF 16V	〃	C401			
	FG 44 41 00	Ceramic Cap.	0.01μF 50V	セラコン	C426～428		W	
	Fi 41 41 00	〃	0.01μF	〃	C406			⚠
	UA 25 41 00	Mylar Cap.	0.01μF 50V	マイラーコン	C423		R,U,A,G C,B	
	FZ 00 55 80	〃	0.047μF 50V	銅リードマイラーコン	C424,425			
	FZ 00 65 50	Electrolytic Cap.	10μF 25V	プラスチックコン	C407,408			
	Ui 91 74 70	〃	47μF 6.3V	ケミコン	C417,418			
	FM 11 61 00	〃	1μF 50V	BPコン	C409,410,421,422			
	Ui 93 82 20	〃	220μF 16V	ケミコン	C411～414			
	Ui 33 71 00	〃	10μF 16V	〃	C402,404			
	Ui 33 74 70	〃	47μF 16V	〃	C405			
	Ui 24 64 70	〃	4.7μF 25V	〃	C403			
※	VA 80 38 00	Coil	38KHz	共振コイル	L401			
※	VA 78 87 00	Pre-Set Potentiometer	B470kΩ	半固定抵抗	VR402			
※	VB 32 85 00	Potentiometer with Motor	50KA×3	モーター駆動ボリューム	VR401			
	iF 00 34 50	Diode	1SS133	ダイオード	D405			
	iF 00 69 10	Zener Diode	MA1100-M	ツェナーダイオード	D404			
	iF 00 71 30	〃	MA1180H	〃	D402			
※	VA 28 34 00	Display Unit	CP1063AGR	表示器	D401			
※	iK 00 05 70	Photo Diode	PN323B	フォトダイオード	D403			
	iX 60 42 00	Transistor	2SC2878(A,B)	トランジスタ	Q401～404 } Inter-changeable			
	iC 33 27 00	〃	2SC3327	〃	〃			
	iC 17 40 00	〃	2SC1740(Q,R,S)	〃	Q405,406 } Inter-changeable	CD-2000	R,U,A,G,C,B	
	iC 26 03 10	〃	2SC2603 (E,F)	〃	〃	CD-2000	R,U,A,G,C,B	
	iX 60 31 80	〃	2SC3312(R,S,T)	〃	〃	CD-2000	R,U,A,G,C,B	
	iG 12 18 00	IC	NJM4560S	IC	IC403 } Inter-changeable			
	iG 13 30 00	〃	BA4561S	〃	〃			
	iG 07 74 00	〃	NJM4556S	〃	IC404			
	iG 14 92 00	〃	BA6340	〃	IC402			
	iG 15 35 00	〃	BA6218	〃	IC405			
※	XA 42 80 01	〃	BA6146	〃	IC401			
	KA 80 32 90	Power Switch	SDLC-1P	パワースイッチ	SW428			⚠
	KA 90 63 80	Switch	EVQ-QRB-04M	ライトタッチスイッチ	SW401～427			
	LB 30 24 20	Phone Jack	Gray	ホーンジャック	JK401 Silver CD-2000			
	LB 30 24 30	〃	Black	〃	JK401 Black			
	LA 00 21 40	Lapping Terminal	P=10, 2P, i-Type	i型ラッピング端子板				
	LB 91 80 30	Base Pin	3P i-Type	XHベースピン				

※New Parts（新規部品）

Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
	LB 60 69 60	DIN Connector		DINコネクター	CD-2000		R,U,A,G,C,B	
	LB 91 80 20	Base Pin	2P i-Type	XHベースピン				
※	CB 64 78 10	Support, Di		サポートDi				
※	AA 62 83 40	〃 ,FL		〃 FL				
※	CB 64 78 00	Sheet Filter		シートフィルター				
※	***NA 09 08 00***	***Balance Amp Circuit Board***		バランスアンプシート	CD-2000M			
	FC 44 34 70	Mylar Cap.	4700pF 50V	マイラーコン	C619,620			
	FC 44 44 70	〃	0.047μF 50V	〃	C611,612,615,616			
	Fi 38 41 00	Ceramic Cap.	0.01μF	セラコン	C621,622 } Inter-changeable			⚠
	VA 89 08 00	〃	0.01μF 250V	〃	〃			⚠
	FU 35 05 00	Mica Cap.	5pF 500V	マイカコン	C603～610			
※	VB 32 87 00	Electrolytic Cap.	10μF 16V	BPコン	C601,602			
※	VB 32 86 00	〃	220μF 16V	〃	C613,614,617,618			
※	GD 90 07 30	Line Filter Coil	3mH	ラインフィルタコイル	L601			⚠
	HU 07 47 50	Metal Film Resistor	75Ω 1/4W	金属皮膜抵抗	R623～626			
	HU 07 62 70	〃	2.7kΩ 1/4W	〃	R627～630			
	HU 07 72 20	〃	22kΩ 1/4W	〃	R605～608,611～614			
	HU 07 81 00	〃	100kΩ 1/4W	〃	R615～622			
	iX 60 42 00	Transistor	2SC2878(A,B)	トランジスタ	Q601,602 } Inter-changeable			
	iC 33 27 00	〃	2SC3327	〃	〃			
	XA 42 60 01	IC	NJM5532S	IC	IC601,602			
	LA 00 21 40	Lapping Terminal	P=10 2P i-Type	i型ラッピング端子板				
	LB 91 80 40	Base Pin	4P i-Type	XHベースピン				

※New Parts（新規部品）

■ EXPLODED VIEW



■ MECHANISM PARTS

Note) ϕ : Diameter

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
※	1	NB 63 17 80	Panel Unit		パネルユニット	Silver CD-2000			
※	〃	NB 63 17 90	〃		〃	Black CD-2000			
※	〃	NB 63 58 10	〃		〃	Black CD-2000M			
※	1-1	CB 64 77 20	Window		ウィンドウ				
※	2	NB 63 55 10	Lid Ass'y		リッド Ass'y	Silver CD-2000			
※	〃	NB 63 55 20	〃		〃	Black			
※	3	NB 63 18 50	Power Button Ass'y		パワーボタン Ass'y	Silver CD-2000			
※	〃	NB 63 18 60	〃		〃	Black			
※	3-1	AA 62 93 70	Spring		スプリング				
※	4	NB 63 26 30	Disc Mechanism Unit	DM-5	D M ユニット				
	5	NA 08 92 30	Servo Circuit Board		サーボシート		CD-500		
※	6	PB 06 54 80	Optical Pick Up Head	DG-1	光ピックアップヘッド	Inter-changeable			
※	〃	VA 75 71 00	〃	MLP-3	〃				
※	7	NA 08 90 00	Main Circuit Board		メインシート	CD-2000		R,U,A,G,C,B	
※	〃	NA 09 06 70	〃		〃	CD-2000		W	
※	〃	NA 09 06 80	〃		〃	CD-2000M		U,A,G,C,B	
※	〃	NA 09 06 90	〃		〃	CD-2000M		W	
※	8	NA 08 90 30	Operation Circuit Board		オペレーションシート	Silver CD-2000		R,U,A,G,C,B	
※	〃	NA 08 90 40	〃		〃	Black CD-2000		R,U,A,G,C,B	
※	〃	NA 09 07 60	〃		〃	Black CD-2000		W	
※	〃	NA 09 07 70	〃		〃	Silver CD-2000		W	
※	〃	NA 09 07 80	〃		〃	Black CD-2000M		U,A,G,C,B	
※	〃	NA 09 07 90	〃		〃	Black CD-2000M		W	
	9	CB 62 01 90	Cord Stopper	CM-22B	コードストッパー			R,A,W,G,B	
	〃	CB 62 02 00	〃	CM-22C	〃			U,C	
	10	MG 00 23 40	Power Cord	6A 250V 2m	電源コード	Inter-changeable		R	⚠
	〃	MG 00 16 30	〃	6A 250V 2m	〃			R	⚠
	〃	MG 00 14 60	〃	10A 125V 2m	〃	Inter-changeable		U,C	⚠
	〃	MG 00 14 50	〃	10A 125V 1.98m	〃			U,C	⚠
	〃	MG 00 09 20	〃	7.5A 250V 2.5m	〃	Inter-changeable		A	⚠
	〃	MG 00 14 90	〃	7.5A 250V 2.5m	〃			A	⚠
	〃	MG 00 23 10	〃	7.5A 250V 2m	〃			A	⚠
	〃	MG 00 16 20	〃	2.5A 250V 2m	〃	Inter-changeable		W,G,B	⚠
	〃	MG 00 23 20	〃	2.5A 250V 2m	〃			W,G,B	⚠
※	11	XA 42 50 01	Power Transformer		電源トランス			R	⚠
※	〃	XA 42 30 01	〃		〃			U,C	⚠
※	〃	XA 42 40 01	〃		〃			A,W,G,B	⚠
	12	KA 40 12 60	Slide Switch		スライドスイッチ	AC SELECTOR CD-2000		R	⚠
※	13	NA 09 08 00	Balance Amp Circuit Board		バランスアンプシート	CD-2000M			
	14	LB 30 22 80	Cannon Socket	XLR-3-32-F77	キャノンソケット	CD-2000M			
※	15	NB 63 18 20	Disc Tray Ass'y		ディスクトレイ Ass'y				
	15-1	CB 62 37 00	Lifter (R)		リフター(R)		CD-X1		
	15-2	CB 62 37 10	〃 (L)		〃 (L)		〃		
	15-3	CB 62 84 70	Disc Pad		ディスクパッド		〃		
	15-4	CB 62 79 60	Cushion Rubber		クッションゴム		〃		
	15-5	AA 61 91 80	SP Lifter		SPリフター		〃		
	15-6	EX 60 02 40	BW Head Tapping Screw	3×8(ϕ10) FCRM3-BI	BWヘッドタッピングネジ				
	15-7	EO 03 00 86	Flat Head Tapping Screw	3×8 ZMC2-Y	皿タッピングネジ	PACK			
	16	AA 62 25 80	Top Cover		トップカバー	Silver CD-2000			
	〃	AA 62 25 70	〃		〃	Black			
	17	AA 62 94 50	Bottom Cover		ボトムカバー	Silver CD-2000			
	〃	AA 62 94 40	〃		〃	Black			
	18	AA 62 38 70	Holder,Plug		プラグホルダー	CD-2000M			

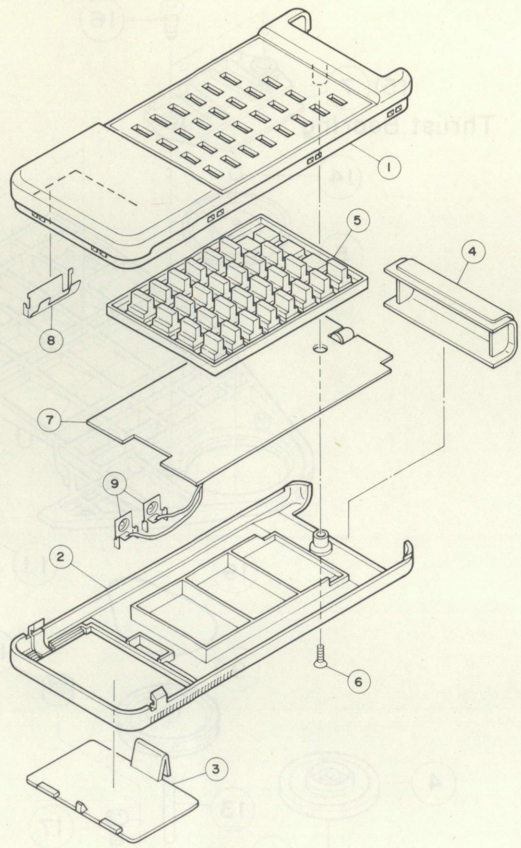
※New Parts（新規部品）

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
※	19	AA 62 83 30	Frame Holder (R)		フレームホルダー(R)	CD-2000M			
※	20	AA 62 83 80	〃 (L)		〃 (L)	CD-2000M			
	21	AA 61 94 20	Ground Plate		アース金具				
※	22	AA 62 83 60	Support, HP		サポートHP				
※	23	AA 62 83 50	〃 , SW		〃 SW				
※	24	NB 63 25 90	Leg Ass'y		脚 Ass'y	Silver			
	〃	NB 62 01 40	〃		〃	Black			
	25	AA 62 09 90	Socket Holder		ソケットホルダー	CD-2000		R,U,A,G, C,B	
※	26	BB 07 12 10	Sheet, Earth		シートアース				
※	27	BA 09 46 80	Damper		ダンパートランス				
※	28	CB 65 33 80	Damper, MT		ダンパーMT				
	29	CB 62 84 10	Damper Rubber		FTダンパーゴム				
※	30	CB 65 18 10	Support, Rod		サポートロッド				
※	31	CB 65 18 30	〃 , MT		〃 MT				
	32	CB 63 16 20	Side Plate		サイドプレート	Silver	CD-2000		
	〃	CB 63 15 90	〃		〃	Black	CD-2000		
	33	CB 64 77 60	Plate		プレート	Black	CD-2000M		
	34	CB 63 17 70	Plate, Stopper		ストッパープレート			R	
	35	EJ 33 00 86	Pan Head Tapping Screw	3×8 FCRM3-BI	ナベタッピングネジ	PACK			
	36	CB 06 88 80	Plastic Rivet		プラスチックリベット				
	37	EV 42 00 36	Toothed Lock Washer	φ3 ZMC2-Y	歯付座金	PACK	CD-2000	W	
	38	Ei 33 01 06	Binding Head Tapping Screw	3×10 ZMC2-BI	バインドタッピングネジ	PACK			
	39	EV 42 30 36	Toothed Lock Washer	φ3 ZMC2-BI	歯付座金	PACK			
	40	AA 62 26 40	Screw for Transport		輸送ネジ				
	41	AA 62 12 10	Special Screw		段付ネジ				
	42	EX 60 02 90	Washer		ポリスライダーワッシャー				
	43	EB 34 01 26	Flat Head Screw	4×12 FCRM3-BI	皿小ネジ	PACK	CD-2000M		
	44	AX 60 02 00	Spacer	φ6.3×5 FCRM3-BI	スペーサー	CD-2000M			
	45	Ei 33 01 46	Binding Head Tapping Screw	3×14 ZMC2-BI	バインドタッピングネジ	PACK	CD-2000M		
	46	EV 20 30 36	Plain Washer	φ3 FCRM3-BI	平座金	PACK			
	47	Ei 33 00 86	Binding Head Tapping Screw	3×8 FCRM3-BI	バインドタッピングネジ	PACK			
	48	Ei 34 01 26	〃	4×12 FCRM3-BI	〃	PACK			
	49	Ei 33 00 66	〃	3×6 FCRM3-BI	〃	PACK			
	50	ED 33 00 86	Binding Head Screw	3×8 FCRM3-BI	バインド小ネジ	PACK		R	
	51	Ei 33 01 26	Binding Head Tapping Screw	3×12 ZMC2-BI	バインドタッピングネジ	PACK			
	52	Ei 32 60 86	〃	2.6×8 FCRM3-BI	〃	PACK			
	53	Ei 33 01 56	〃	3×15 FCRM3-BI	〃	PACK			
	54	ED 32 60 86	Binding Head Screw	2.6×8 ZMC2-BI	バインド小ネジ	PACK			
	55	Ei 02 61 06	Binding Head Tapping Screw	2.6×10 ZMC2-Y	バインドタッピングネジ	PACK			
			Accessories		付属品				
		Mi 06 62 10	Pin Plug Cord		出力コード	CD-2000			
		VA 97 63 00	〃		〃	CD-2000M			
※		VA 80 07 00	Remote Control Transmitter	RS-D20	リモートコントロールトランスミッター	Black			
※		VA 88 58 00	〃	〃	〃	Silver			
			Dry Cell	AA, R6	単3乾電池				
		PB 06 42 40	Adaptor, Rack Mount	RMA-C70	ラックマウントアダプター	CD-2000M			

※New Parts (新規部品)

A	B	C	D	E

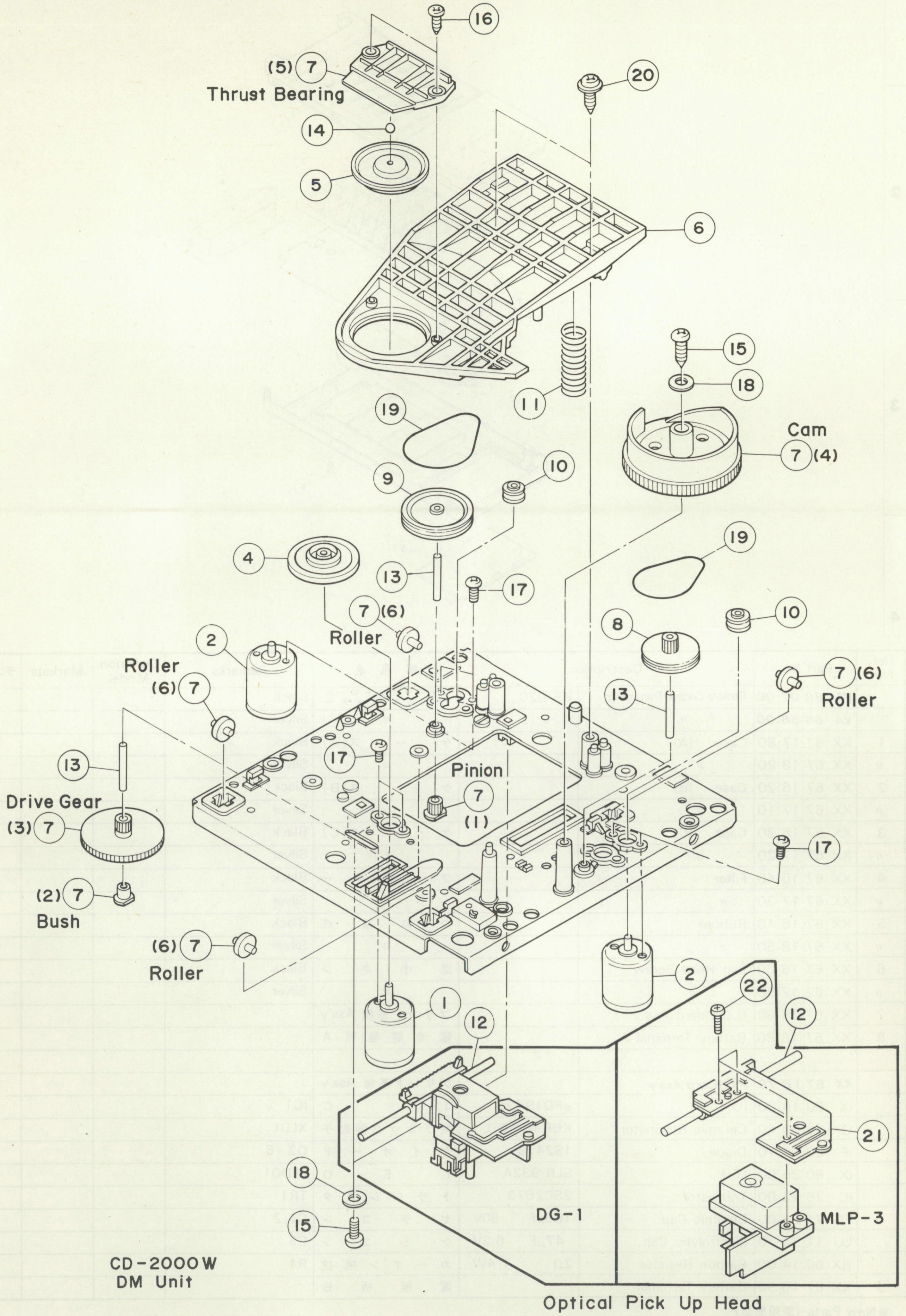
■EXPLODED VIEW (RS-D20)



	Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
※		***VA 80 07 00***	***Remote Control Transmitter***	RS-D20	リモートコントロール トランスミッター	Black			
※		***VA 88 58 00***	〃	〃	〃	Silver			
※	1	XX 67 17 80	Case (A)		ケース(A)	Black			
※	〃	XX 67 18 20	〃		〃	Silver			
※	2	XX 67 16 20	Case (B)		ケース(B)	Black			
※	〃	XX 67 17 10	〃		〃	Silver			
※	3	XX 67 16 30	Case (C)		ケース(C)	Black			
※	〃	XX 67 17 20	〃		〃	Silver			
※	4	XX 67 16 40	Filter		フィルター	Black			
※	〃	XX 67 17 30	〃		〃	Silver			
※	5	XX 67 18 10	Rubber		ゴム接点	Black			
※	〃	XX 67 18 50	〃		〃	Silver			
※	6	XX 67 16 60	Flat Head Screw		皿小ネジ	Black			
※	〃	XX 67 17 50	〃		〃	Silver			
※	7	XX 67 18 60	P.C.Board Ass'y		プリント基板 Ass'y				
※	8	XX 67 16 80	Battery Terminal A		電池電極板 A				
※		***XX 67 16 70***	***P.C.Board Ass'y***		プリント基板 Ass'y				
		iX 60 16 00	IC	μPD1943G	IC	IC1			
		QX 60 00 40	Ceramic Resonator	KBR-455BTL	セラミック振動子	XL01			
		iF 00 06 70	Diode	1S2473	ダイオード	D2～6			
		iX 60 36 00	LED	SLR-932A	LED	LED01			
		iC 26 73 00	Transistor	2SC2673	トランジスタ	TR1			
		FG 21 21 00	Ceramic Cap.	100pF 50V	セラコン	C1,2			
		UJ 11 74 70	Electrolytic Cap.	47μF 6.3V	ケミコン	C3			
		HX 60 14 00	Carbon Resistor	2Ω 1/4W	カーボン抵抗	R1			
※	9	XX 67 16 90	Battery Terminal		電極板 B				

※New Parts (新規部品)

■EXPLODED VIEW(Disc Mechanism Unit)



■ MECHANISM PARTS(Disc Mechanism Unit)

Note) φ : Diameter

Ref. No.	Part No.	Description		部品名	Remarks	Common Model	Markets	ランク
	NB 63 26 30	*Disc Mechanism Unit*		DMユニット				
※ 1	JC 00 12 60	Motor, Disc		ディスクモーター				
※ 2	JC 00 12 70	〃, Loading		ローディングモーター				
4	NB 62 99 70	Turntable Unit		ターンテーブルユニット				
5	CB 64 24 00	Stabilizer		スタビライザ				
6	CB 62 36 80	Flapper		フラッパ				
7	NB 62 79 20	Mold Kit(2)		キットモールド(2)				
8	CB 63 47 90	Idle Pulley		アイドルプーリ				
9	CB 63 48 00	C Pulley		Cプーリ				
10	CB 63 47 80	P Pulley		Pプーリ				
11	AA 62 43 50	Spring		フラッパースプリング				
12	AA 61 93 20	Shaft (L)		シャフト(L)				
13	AA 61 93 30	〃 (S)		〃 (S)				
14	EZ 00 19 80	Steel Ball	φ2.5	スチールボール				
15	Ei 33 00 86	Binding Head Tapping Screw	3×8 FCRM3-BI	バインドタッピングネジ	PACK			
16	Ei 32 60 56	〃	2.6×5 FCRM3-BI	〃	PACK			
17	ED 32 00 56	Binding Head Screw	2×5 ZMC2-BI	バインド小ネジ	PACK			
18	EV 20 30 36	Washer	φ3 FCRM3-BI	平座金	PACK			
19	CB 63 78 30	V-Belt		Vベルト				
20	EK 03 50 20	BW Head Tapping Screw	3×12 ZMC2-Y	BWヘッドタッピングネジ				
21	NB 62 99 80	S.L. Outsert		S.L.アウトサート	MLP-3			
22	ED 32 60 46	Binding Head Screw	2.6×4 FCRM3-BI	バインド小ネジ	PACK			

※New Parts（新規部品）

Part List for Carbon Resistor

Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ353100	※
1.8 〃	HJ353180	※
2.2 〃	HJ353220	HF853220
3.3 〃	HJ353330	HF853330
4.7 〃	HJ353470	HF853470
5.6 〃	HJ353560	HF853560
10 〃	HJ354100	HF854100
15 〃	HJ354150	HF854150
22 〃	HJ354220	HF854220
27 〃	HJ354270	HF854270
33 〃	HJ354330	HF854330
39 〃	HJ354390	HF854390
47 〃	HJ354470	HF854470
56 〃	HJ354560	HF854560
68 〃	HJ354680	HF854680
82 〃	HJ354820	HF854820
100 〃	HJ355100	HF855100
110 〃	HJ355110	HF855110
120 〃	HJ355120	HF855120
150 〃	HJ355150	HF855150
160 〃	HJ355160	※
180 〃	HJ355180	HF855180
220 〃	HJ355220	HF855220
270 〃	HJ355270	HF855270
330 〃	HJ355330	HF855330
390 〃	HJ355390	HF855390
470 〃	HJ355470	HF855470
510 〃	※	HF855510
560 〃	HJ355560	HF855560
680 〃	HJ355680	HF855680
820 〃	HJ355820	HF855820
910 〃	HJ355910	HF855910
1.0K Ω	HJ356100	HF856100
1.2 〃	HJ356120	HF856120
1.5 〃	HJ356150	HF856150
1.8 〃	HJ356180	HF856180
2.0 〃	HJ356200	HF856200
2.2 〃	HJ356220	HF856220
2.4 〃	HJ356240	HF856240
2.7 〃	HJ356270	HF856270
3.0 〃	HJ356300	HF856300
3.3 〃	HJ356330	HF856330
3.6 〃	HJ356360	HF856360
3.9 〃	HJ356390	HF856390
4.7 〃	HJ356470	HF856470
5.1 〃	HJ356510	HF856510
5.6 〃	HJ356560	HF856560
6.8 〃	HJ356680	HF856680
8.2 〃	HJ356820	HF856820
9.1 〃	HJ356910	HF856910
10 〃	HJ357100	HF857100
12K Ω	HJ357120	HF857120
15 〃	HJ357150	HF857150
18 〃	HJ357180	HF857180
22 〃	HJ357220	HF857220
27 〃	HJ357270	HF857270
33 〃	HJ357330	HF857330
39 〃	HJ357390	HF857390
47 〃	HJ357470	HF857470
56 〃	HJ357560	HF857560
68 〃	HJ357680	HF857680
82 〃	HJ357820	HF857820
91 〃	HJ357910	HF857910
100 〃	HJ358100	HF858100
120 〃	HJ358120	HF858120
150 〃	HJ358150	HF858150
180 〃	HJ358180	HF858180
220 〃	HJ358220	HF858220
270 〃	HJ358270	HF858270
330 〃	HJ358330	HF858330
390 〃	HJ358390	HF858390
470 〃	HJ358470	HF858470
560 〃	HJ358560	HF858560
680 〃	HJ358680	HF858680
820 〃	HJ358820	HF858820
1.0M Ω	HJ359100	HF859100
1.2 〃	HJ359120	※
1.5 〃	HJ359150	HF859150
1.8 〃	HJ359180	HF859180
2.2 〃	HJ359220	HF859220
3.3 〃	HJ359330	HF859330
3.9 〃	HJ359390	※
4.7 〃	HJ359470	※

85.7.